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ABSTRACT

A study evaluated the economic outcomes of one state-sponsored training program--the California Employment Training Panel (ETP)--which captured the benefits of private job training within a public program. It examined the impact of ETP training on a new group of 41,959 ETP trainees trained in 1990-91 in the year after training and estimated the impact of this training on the California economy. It tracked 46,946 ETP trainees trained in 1989-90 in their second year after training to determine whether the impact of ETP training persisted. The following conclusions were reached: public investment in ETP training reduced unemployment and increased earnings for individual workers; ETP training facilitated transitions between jobs for unemployed workers and technical and organizational changes within companies for employed workers; ETP training was a tool for economic development in California; performance-based contracting appeared to be the policy that allowed ETP to generate outcomes similar to private, employer-provided training; and ETP's success was due in large part to the dynamic or ad hoc character of the funding process. The success of ETP provided a model for future national training and employment policies. Future research was recommended to focus on understanding the impact of ETP training on employment stability, characteristics of successful programs, and optimum level of training. (Contains 33 references. Appendixes include data tables that illustrate characteristics of completers and dropouts, multipliers, and characteristics of retrainees and new hires.) (YLB)

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CALIFORNIA STATE UNIVERSITY
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Public Training with Private Efficiency:

An Analysis of the Outcomes of California Employment Training Panel Programs

By:

Richard W. Moore
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G. Michael Phillips

California State University, Northridge
School of Business Administration and Economics

Submitted To:

The California Employment Training Panel
Sacramento, California
May, 1994

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Executive Summary

Opinion leaders across the nation call for increased spending on job training to meet a host of challenges, ranging from international competition, to changing technology and production techniques, to retraining workers displaced by defense cuts. New legislation proposed by the Clinton administration attempts to address the complex problem of providing employment and training services to displaced workers by consolidating employment services and expanding training programs at an estimated cost of $13 billion. Research on job training presents policy makers, who must consider training proposals, with a paradox. Essentially, research shows that employer-provided, job-related training boosts worker productivity and increases workers' earnings substantially. Yet public programs, even those aimed at established workers who have lost their jobs, show only a marginal impact on earnings and employment. The problem for policy makers is how to create training programs that, while publicly supported, will generate the same level of increased earnings and productivity as private training created solely in response to market forces.

This study evaluates the economic outcomes of one state sponsored training program --the California Employment Training Panel (ETP)-- which appears to have captured the benefits of private job training within a public program. The experience of ETP offers insights that can contribute to an effective federal effort to help displaced workers.

Objectives and Method

The key goal of this study was to see if ETP training, given the shifting economic conditions, continued to have the same success found in earlier studies, and to pull from the results implications for Panel policy.

Essentially, this study examined the impact of ETP training on a new group of ETP trainees, those trained in 1990-91, in the year after training, and estimated the impact of this training on the California economy. In addition, the study tracked ETP trainees trained in 1989-90 into their second year after training, to determine if the impact of ETP training persisted.

Conclusions

1. **Public investment in ETP training reduces unemployment and increases earnings for individual workers in the case of both New Hires and Retrainees.**

Our analysis of the 1990-91 trainees shows that completing ETP training has a significant impact on workers' earnings, increasing the real earnings of New Hires by $9,283 and Retrainees by $2,621 in the year after training. It appears from the experience of the 1989-90 cohort that these increases persist for at least a second year and probably longer. These figures are comparable to results found in national studies of employer-provided training for new workers and existing employees. In addition, both New Hires and Retrainees who complete training are unemployed less and receive less in unemployment insurance payments than those who do not complete. For example, New Hires who completed training collected an average of $839 less in UI payments, in the year after training, than New Hires who dropped out of training. Similarly, Retrainees who completed training collected $193 less in UI payments than Retrainees who dropped out of training. These changes represent increased productivity and employment stability for workers, many of whom were in danger of losing their jobs.

2. ETP training facilitates transitions between jobs for unemployed workers and technical and organizational changes within companies for employed workers.

The California economy is going through an extraordinary transformation, and all that is certain is that there will be more change in the future. The success of ETP training in boosting wages and reducing unemployment among New Hires shows that it is an effective program for transitioning dislocated workers into new jobs. Its performance appears to be superior to other publicly funded displaced workers programs studied by other researchers.

Since many ETP programs involve either the adoption of new technology or the implementation of new production techniques, such as Total Quality Management or Just-in-time Delivery, the increased earnings of Retrainees indicate that these approaches have successfully raised worker productivity, resulting in increased earnings and less unemployment. Thus, it appears that ETP training can serve as a catalyst for promoting these types of organizational change, which in turn helps California companies cope with the changing economic environment in which they must operate.

3. ETP training is a tool for economic development in California.

Our analysis of the economic impact of ETP training shows that training can be a tool for economic development. ETP training has an impact on the economy several ways. First, training reduces unemployment and hence reduces Unemployment Insurance payments. Next, it increases worker productivity and hence earnings. If these workers are employed in basic industries, the increase in productivity and earnings has a multiplier or ripple effect and stimulates other economic activity within the state. Overall, we estimated the impact of ETP training to be between $99 million and $516 million in the year after training, depending on the assumptions employed. It appears from our preliminary results and related research that training will continue to have a positive impact on worker earnings, and hence the economy, for up to twelve years.

This analysis shows that ETP's new policy of targeting basic industries should increase the impact of ETP training on the economy. Redirecting training funds from service businesses to basic industries will increase the net economic impact. Productivity and earnings increases in basic industries result in a multiplier effect, that is, they generate economic activity and jobs in local suppliers. In contrast, increased economic activity in one service sector company generally comes at the expense of another company elsewhere in the sector.

While ETP training is not a panacea for everything that is wrong with the California economy, it is one of many tools that policymakers can use to position California for success nationally and internationally.

4. **Performance-based contracting appears to be the policy that allows ETP to generate outcomes similar to private, employer-provided training and should be maintained.**

Our analysis shows that the outcomes of ETP training in terms of increased worker earnings are similar to the outcomes other researchers have found for training which is purely private. This is unusual in a publicly-funded training program. In our view, the key to ETP's success is performance-based contracts, which hold training agencies responsible for placing and retaining trainees on a related job. These tough performance standards create the right incentives for contractors. In the case of New Hires, neither employers nor training agencies will enter into a contract unless they are certain they will be able to employ successful completers. While this may reduce the number of New Hires trained, it certainly increases the chance that those trained will end up in related employment. Our research also indicates that New Hires will experience much larger increases in earnings than trainees in public programs where training agencies are held less accountable for placement.

Allowing employers to select trainees also contributes to ETP's success. In the case of New Hires, allowing employers to select trainees increases the chance that there will be a good fit between the new employee and the job. In the case of Retrainees, allowing employers to select the employees who will be trained means that resources are more likely to be targeted on groups with high potential productivity gains.

5. **ETP's dynamic, project-driven funding system and willingness to experiment should be continued.**

ETP's success is due in large part to the dynamic or ad hoc character of the funding process. Each project is developed and reviewed individually. ETP has avoided establishing long-term, fixed relations with training providers. Instead, it remains open to proposals from a variety of employers and training agencies. This has allowed ETP to move funds to employers and agencies who are most capable of delivering training that leads to jobs. Focusing on individual training programs rather than subsidizing institutions has helped keep the emphasis on performance. In a period of rapid economic and technological change, maintaining this dynamic approach is crucial.

There is some preliminary evidence that higher per trainee expenditures lead to increased earnings for trainees. This pattern fits with other studies of employer-sponsored training that showed earnings to increase more for longer or more frequent training. Since higher costs generally represent training of greater length or intensity and not just high cost, we recommend that ETP consider experimentally targeting funds on longer, more intense training programs and then evaluate to see if they yield greater earnings increases.

One issue raised by the new targeting strategies is that ETP may not be able to develop enough projects that meet the criteria in the new legislation to spend all of its money. This is a relatively unusual problem in the public sector. In our view, if ETP is unable to expend all its budgeted funds on targeted projects in the current year, it is not necessarily a problem. It will take time to develop the outreach programs and public information needed to generate a sufficient number of proposals that meet the new priorities. We recommend that ETP carry over surplus funds rather than give up on the targeting strategy in the short run.

6. The success of ETP, documented here, provides a model for future national training and employment policies.

As federal policymakers develop legislation to expand and streamline federal employment and training programs for established workers, they should consider the lessons learned from ETP's experience. In our view these lessons are:

(1) tough performance contracting standards provide the incentives to make sure that training pays off;

(2) employers can be used effectively as training providers;

(3) when employers are involved in developing curriculum and selecting participants, training is more effective; and

(4) developing programs on a project-by-project basis, including aggressive searches for industries and companies where training can boost productivity and earnings, is an effective method for keeping training in touch with the labor market.

7. Future research should focus on understanding the impact of ETP training on employment stability, the characteristics of successful projects, and the optimum level of training.

The research reported here takes a significant step toward understanding the overall impact of ETP training on earnings in the short and midterm, but much remains to be done. An important issue which future research will have to address is the impact of training on employment stability. Do workers who receive training remain within the same occupation and with the same employer longer than they would otherwise? In today's economy many workers are forced to patch together several part-time jobs to earn a living. The impact of training on the incidence of part-time work and multiple jobbing is another aspect of employment stability that merits study.

This study has considered ETP training as a whole. We recognize that within the universe of ETP training there are hundreds of programs, some of which have a powerful effect on worker productivity and earnings and some which have little or no effect. Identifying the characteristics that distinguish effective projects from less effective projects will yield important information for targeting ETP funding and evaluating project proposals.

Data from this analysis suggest that longer and more intensive training has a greater impact on earnings. Further research needs to identify the optimum level of training, given the circumstances of the company. This may allow ETP to determine the level of support that is appropriate, in an objective manner.

Finally, future research is needed to determine if ETP's new funding priorities, which target high performance workplaces, actually increase the impact of ETP training on individuals and the economy as a whole.

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Introduction: The Job Training Paradox

Opinion leaders across the nation call for increased spending on job training to meet a host of challenges, ranging from international competition, to changing technology and production techniques, to retraining workers displaced by defense cuts. New legislation proposed by the Clinton administration attempts to address the complex problem of providing employment and training services to displaced workers by consolidating employment services and expanding training programs at a cost of $13 billion. Research on job training presents policy makers, who must consider training proposals like this one, with a paradox. Essentially, research shows that employer-provided, job-related training boosts worker productivity and increases workers' earnings substantially. Yet public programs, even those aimed at established workers who have lost their jobs, show only a marginal impact on earnings and employment. The problem for policy makers is how to create training programs that, while publicly supported, will generate the same level of increased earnings and productivity as private training created solely in response to market forces.

This study evaluates the economic outcomes of one state sponsored training program --the California Employment Training Panel (ETP)-- which appears to have captured the benefits of private job training within a public program. The experience of ETP offers insights that can contribute to an effective federal effort to help displaced workers.

Job Training In America

As America struggles to meet the challenge of the emerging global economy, it has come to understand that education and training are not merely social programs but key strategies for economic development. In the 1960's and 1970's, the creation of public training programs such as CETA and JTPA were rationalized as a way to solve social problems such as discrimination, crime and urban decay, by helping disadvantaged individuals succeed in the job market. Today, three powerful forces are converging to make job training and retraining a central public policy issue in the 1990's. First, rugged global competition from emerging nations has combined with rapidly evolving technology to change the nature of work. Increasingly, frontline workers must act autonomously or in small groups to make decisions and exercise judgements which have traditionally been reserved for managers. In the words of one analyst, the new economy "...puts a special premium on 'brain power' instead of 'brawn power' as the engine of economic growth," Salamon, 1991, p.1). Second, in part because of this shift in the character of work, employers are increasingly concerned that new workers are poorly prepared to meet the demands of the new globally competitive workplace. Employers also worry that experienced workers may lack the skills and flexibility to adapt to new production systems. Many analyst agree that if workers want to increase their job security, they must raise their skills. Thirdly, the characteristics of the workforce are becoming more diverse. New workers will be disproportionately minorities, women and immigrants who have traditionally had less access to education and training.

It can be argued that these trends have hit California first and hardest. Nations on the Pacific rim compete directly with California industries in fields such as electronics and computers, where technology is evolving rapidly. The decline in federal defense spending, which is particularly acute in California, has put the jobs of established American workers at risk and even threatened the survival of major American corporations. Finally, California is experiencing the most dramatic demographic changes in the nation as immigrants continue to choose California as their port of entry.

Scholars and policy makers agree that a highly skilled workforce is a key to prosperity in the emerging global economy and have called for a new policy of investment in human- capital (See for example, Marshall and Tucker, 1992 and Hornbeck and Salaman, 1991) . The premise of all these writers is that only a highly skilled workforce can have the levels of productivity that will warrant the high wages that can support a middle class lifestyle that includes home ownership and leisure. Only high wage jobs can generate the tax revenues needed to support the public infrastructure of schools, universities, national parks, transportation systems and other amenities to which Americans have become accustomed. The Commission on the Skills of the American Workforce put it bluntly in its report title: America's Choice: high skills or low wages!.

As policy makers began to focus on education and training as an economic development strategy, they first turned their attention to the components of the system that prepared new workers, particularly the public schools. Beginning with A Nation at Risk:The Imperative for Educational Reform in 1983, a flood of reports called for various reforms in public elementary and secondary education to improve the preparation of young people for work. Other analysts turned their attention to the much larger group of existing workers to examine the training that workers receive once they were on the job. What they found was that the pattern of training in industry had not changed significantly since earlier studies in the 1970's (such as Lusterman, 1977), despite subsequent radical changes in technology and production techniques, the rise of total quality management approaches, and near hysteria about the quality of workmanship in American products.

Patterns of Worker Training

American employers invest a substantial amount in training their workforce. A federally funded study estimates that employers spend $30 billion annually on formal training and an estimated $90 billion to $180 billion on informal training (Carnavale and Gainer, 1989). Most of this money is spent training already highly skilled, often college educated, professionals, technical workers and managers rather than in front line workers who actually produce the products or provide the services. For example, the National Center for Education and the Economy found that of the $30 billion dollars spent on training each year, two-thirds goes to training workers who already have a college degree (National Center for Education and the Economy, 1992, p.49). A recent large-scale survey by the Federal Department of Labor confirmed these findings. The study asked a national sample of workers if they had received job- related training since getting hired. Sixty-seven percent of professional workers and 53% of executive, administrative and managerial workers said they had, compared to only 25% of machine operators, assemblers and inspectors, and a mere 15% of handlers, equipment cleaners and laborers. The study also illustrated the predominance of employer-supplied upgrade training over public-supported training. Forty-two percent of the workers who reported they received school-based upgrade training were sponsored by their employers, while only three percent reported government-sponsored training (How Workers Get Their Training, 1992). In addition, training is generally limited to the largest employers. These patterns persist even in industries experiencing rapid technological change. A Rand Corporation study (Lillard and Tan, 1986) found that in industries undergoing rapid technological change, workers with a college degree became even more likely to get formal company training, while those with lower levels of education became less likely to get training. An other study sponsored by the Federal Department of Labor, Bishop, et.al.(1985) examined the training of new employees during their first two years of employment. These researchers found that new employees with a college degree received 40% more training than workers with only a high school diploma, who in turn received 40% more training than workers without a high school diploma.

Training is not uniform across all industries or all sizes of companies. For example, the American Society for Training and Development estimates that $27 billion of $30 billion spent annually is spent by very large companies making up only 0.5% of all employers (Carnavale, 1986). In their Department of Labor study, Bishop et.al. (1985) found slightly different patterns, looking only at workers in their first two years of employment with an employer. Their study found that both large companies, (those with over 200 employees), and small companies, (those with under 10 employees), invest more in training than medium-sized companies.

In America, while private employers are focusing on their highly educated workers, public investment is focused principally on the most disadvantaged people in the labor market. The federal Job Training Partnership Act (JTPA), which is the largest federal job training program, focuses principally on disadvantaged youth and adults, particularly high school dropouts, welfare recipients and the long-term unemployed. For example, in California, the 1992-93 budget for JTPA Title II A which serves disadvantaged youth and adults was $209 million, while an additional $79.2 million was spent on summer youth programs, and the budget for displaced workers, Title III, was only $53.4 million. No federal money was allocated for training employed workers.

The Employment Training Panel (ETP) training program can be viewed as two distinct training programs. New hire training, which retrains displaced workers who are collecting unemployment insurance benefits or who have exhausted their benefits, is comparable to other public displaced worker programs, which are examined later. The bulk of ETP programs are retrainee programs, which train employed workers who are in danger of being displaced. These programs are comparable to company-provided training which we discuss in the next section.

Impact of Company Training

Research on employer-provided training is scattered and limited but it consistently shows that on-the-job training or employer-provided classroom training boosts both worker productivity and workers' earnings. In a review of a variety of studies that used national databases, Mangum et.al (1990) found that employer-based training raised earnings between 10% and 30%, and that these increases persisted for 13 to 14 years.

Three well-known national studies illustrate these effects on individuals. In a Rand Corporation Study, Lillard and Tan (1985, p.58) estimated that employer-provided training boosted wages almost 17%, twice as much as job-related training provided outside the company. Bishop and his colleagues measured the impact of training on wages and productivity separately and found dramatic positive effects on both in the first two years of employment. Interestingly, these researchers found that, "... an additional 100 hours of training raises productivity of typical employees by 10-20%..." (Bishop, et.al., 1985, p.xxii). Overall, Bishop and his colleagues conclude that the rate of return on investments in training by employers are high, averaging about 30% (Bishop,et.al.,1985, p.xxi). Lynch (1992) studied the impact of training on the earnings of youth. She found that company-provided training increased young workers' earnings by 13% to 17%.

We found only one study which looked at the impact of training programs on an entire company's productivity. The study (Bartel, 1991) used a national sample of manufacturing firms to study the impact of worker training on company productivity. The study found that companies that were less productive than average in 1983, that implemented new worker training programs had significantly larger gains in productivity by 1986 than companies that implemented other new personnel policies. This is an important study because it suggests that training does not just enhance the productivity and earnings of individual workers but can contribute significantly to the productivity of the entire company.

Given the benefits of training to both employers and workers, Bishop et.al. conclude that both employers and employees underinvest in on-the-job training. Lynch, after comparing American workplace training with our European and Japanese competitors' training systems, agrees:

> "Underinvestment in training in the U.S. appears to be of two forms. First, in certain sectors, U.S. firms may be spending less and providing more limited training to their nontechnical or non-managerial employees than their competitors in other countries. Second, in other sectors the level of expenditures or hours of training may be the same, but due to lower initial skill levels, this level of investment is not sufficient to achieve the same degree of skill proficiencies found in countries such as Japan or Germany." (Lynch, 1993, p.2)

Looking only at data on training in America, Pines and Carnavale reach a similar conclusion: "Our analysis of the available data...leads us to conclude that formal training has a relatively low status and low frequency in the U.S. workplace and that employers, current commitments to formal training and human capital development are insufficient." (Pines and Carnavale, 1991, p.256). The key question for policymakers is twofold: If training has significant payoffs for both the employer and the employee, why is it so limited in American industries? Is this a problem that warrants large scale public intervention?

Barriers To Training

Economists have wrestled with the question of why, if companies need skilled workers to succeed and investments in training pay a dividend, do they not invest more in training frontline workers. Lynch (1993), in her comparative study of U.S. and European training systems, offers a variety of theoretical explanations. In her explanations of low U.S. investment in training, Lynch draws on economists' distinction between "general skills," (such as math, basic literacy or how to use a keyboard), which easily transfer from one job to another, and "specific skills," which can only be used on a particular job or for a particular employer.

She reasons that employers may know that more and better general skills would improve workers' productivity. However, because of high turnover rates, the employer does not invest in training because the employee will not remain with the company long enough to recapture the investment in training. A related barrier is the fact that if one employer invests in training a worker in skills that would transfer to another company, a second employer may hire that worker away. Thus, the worker may benefit from the training but the employer who paid for it will not. This practice is widely referred to as "poaching" or "head hunting".

This logic, though, does not explain why employers would not invest in skill training specific to the company which does not transfer to other companies. In this case, Lynch suggests a lack of capital to fund training. It may be more difficult for companies to borrow for training than for traditional capital investments (such as buying a truck or a building) since training does not produce a tangible asset that can be used as collateral. Thus, if companies cannot generate the revenue internally to pay for training, they may not train at all.

If an individual can earn more by increasing his or her skills, why then doesn't the individual invest in training? Bishop et.al (1985) argue that workers would borrow for training but they simply can not get access to capital at a rate that would make the investment worthwhile, particularly if workers are inexperienced. It is because of this problem that the federal government has sponsored a massive student loan program for college students, which not only subsidizes the cost of borrowing but guarantees repayment to lenders. No similar program exists for workers who wish to upgrade their skills without enrolling in a college degree or certificate program. Other researchers suggest that individuals lack information about the value of training and fail to invest in training because they are not aware of the potential return (Salamon, 1991).

A final barrier, raised by Lynch and supported by other research, is that small companies don't invest in training because the cost of training is higher for them. A small company that may want to train one or two workers faces much higher costs per worker than a large company with hundreds of workers to train. It may be more costly for small companies to take workers away from productive work for training because they lack flexibility. Finally, small companies, which have a limited ability to offer opportunities for promotion, may be more vulnerable to poaching than larger companies that can offer promotions, and thus smaller companies see investments in training as riskier. In all these cases, the cost of training will be higher and thus the economic return on training investments may be much less for a small company.

Despite these arguments, economic reasoning may not completely explain the reluctance of companies to invest in training frontline workers. American industry achieved world dominance through a production approach, known as Taylorism or scientific management, in which the production process is broken down into a series of simple tasks. Each worker is assigned a few simple tasks which they do over and over. Thus, a team of relatively low-skilled workers can produce a sophisticated product such as an automobile, with narrow and limited training (Taylor, 1911). This system thrived when products were standardized, technology remained unchanged for long periods, and workers accepted the monotonous nature of the work.

Drucker (1989), and other contemporary management theorists have recognized that this mode of production, which is built on interchangeable low skilled workers, will not be able to respond effectively to changing technology and the shifting demands of a global market. These contemporary theorists argue that responsibility for making decisions and innovations must be pushed down the organization to the individual workers, who must be flexible, able to communicate effectively with management and each other, and capable of understanding the entire production process and their role within it. Achieving this will mean significant investments in training all workers, not just managers and highly-skilled professional and technical workers. Yet, many managers and entire companies cling to the tradition of Taylorism and the resulting organizational culture which does not value training frontline workers.

Public Response to Training Needs

Today policy makers confront a labor market in which rapid economic change has created a large number of displaced workers who once earned high wages but whose skills are not competitive in a changed market. At the same time, the jobs of other workers are threatened as companies struggle to meet the challenge of global competition and shifting markets. Policy makers have come to wonder if some combination of the barriers discussed before keep the market from producing the optimum level of training. While many other countries subsidize or mandate employer based training, there has been no large scale federal initiative aimed at this problem.

In contrast to the absence of federal programs in the last decade, over forty states have created job training programs aimed at improving the skills of frontline workers or retraining workers who have been displaced. A recent national survey found 41 state level, customized training programs for employers (National Center for Research in Vocational Education and The Center for Labor Research and Education, 1993). The programs tend to be small, with a total current budget of just $339.9 million for all forty programs, of which California's Employment Training Panel (ETP) makes up 30%.

Initially, most state programs focused on training recently dislocated workers, while today most programs focus on training newly hired workers, but 30 of the states do allow for the retraining of existing workers. Some states have attempted to address the barriers discussed above by targeting training on small and medium-sized companies which may have difficulty providing training themselves.

States also use the program as an economic development tool in that they offer subsidized training as an incentive for companies to locate within the state or to remain in the state. Some programs target training on manufacturing companies, which are most likely to face national and international competition. In some states, training grants are tied to companies' plans to expand or invest in new equipment.

The Clinton administration and Secretary of Labor Robert Reich are particularly interested in "investing in people" or, put more specifically, in investing public funds to encourage training to upgrade the skills of the American workforce. The key issue for policymaker is: can publicly-funded programs expand the scope of job training and still achieve the same results that have been documented for employer provided training produced by the market.

Do Public Programs for Experienced Workers Make a Difference?

Despite a growing national consensus that training is necessary for the nation's economic competitiveness, there is a distressingly limited amount of research on the effectiveness of publicly supported training of employed workers. Most published research focuses on evaluating the impact of training and placement services on recently displaced workers. Bloom et.al. (1986), using an experimental design again, found only small impacts for adults assigned to JTPA training. The study found that women assigned to JTPA earned $539 more than women in the control group during the first 18 months after training, a small but statistically significant margin. Men assigned to JTPA earned $550 more than men in the control group during the first 18 months after training; however, this difference was not statistically significant and could be due to random chance. When the study looked only at those people who actually received services, as opposed to all assigned to JTPA, the gap between those served and the control group rose to $873 for women and $935 for men.

Two recent studies have examined the impact of job service programs and training on displaced workers in Texas (Bloom, 1990) and New Jersey (Corson, et.al., 1989 Anderson, Corson and Decker, 1990). These studies employed an experimental design and found impacts of only several hundred dollars in the first year after receiving services. The New Jersey study (Corson, et.al., 1989) examined three different types of services: job search, job search with a cash bonus for finding a job, and job search with training. Interestingly, the treatment that involved training had the smallest impact on earnings, about $200, of all the services tested. In a longer-term followup of these workers, Anderson, Corson, and Decker (1990) found that none of the three groups had any increase in real earnings, (i.e., increases that exceeded inflation). The Texas study (Bloom, 1990) found substantially larger impacts, ranging from $673 for men to $1,148 for women, who received a mixture of job search and short-term skill training services.

The limited research on the impact of publicly subsidized programs on retraining existing workers is essentially limited to two previous studies of the California Employment Training Panel. The first study (Moore, Wilms, and Bolus, 1988) examined the earnings and employment records of an early group of 3,913 ETP trainees trained between 1983 and 1985. The study compared earnings in the years before and after training for trainees who were unemployed when they entered training (called "New Hires," who are roughly comparable to the displaced workers in the studies reported before) and trainees who were in danger of loosing their jobs but were still employed (called "Retrainees"). The study concluded that ETP training did have a significant positive impact on the earnings of trainees. The impact on the annual earnings of New Hires was estimated to be almost $6,000, after controlling for differences in individual characteristics and program variables. The impact on Retrainees was not statistically significant, after controlling for background and program differences, but estimated to be about $2,000.

A more sophisticated study was conducted in 1992 (Moore and Blake, 1992). This study examined the earnings of 49,946 trainees trained during the 1989-90 fiscal year. Once again, the study compared earnings and employment records in the years before and after training to estimate the impact of training. The study found that after controlling for inflation and differences in background characteristics of New Hire trainees, the impact of completing ETP training was $7,700 in the first year after training. These results contrast dramatically with the results reported earlier for displaced workers who are similar to the New Hires. The displaced workers served in public programs reported earlier had impacts on earnings ranging from $0 to $1,100, compared to the $7,700 found for ETP New Hires.

The study also found that the impact of completing ETP training on Retrainees averaged over $1,600 in real terms, and, after controlling for background differences between completers and dropouts, was $4,000 in the first year after training. These results support the findings of Lillard and Tan (1986) and Bishop et.al. (1985), that employer-provided training can dramatically increase the productivity and earnings of individual workers. The difference is that ETP Retrainees were part of a publicly-subsidized program.

Moore and Blake (1992) found that both Retrainees and New Hires who completed ETP training experienced less unemployment and collected less in Unemployment Insurance payments than workers who dropped out of ETP training, indicating that completing training may have increased employment stability for these workers. Again, these results concur with Bishop et.al.'s (1985) findings that workers who receive more on-the-job training stayed with their employer longer and were unemployed less.

Going beyond the effects of ETP training on individuals, Moore and Blake estimated the impact of ETP training on the state's economy as a whole in the year after training. They estimated the program had an impact on the California Economy through four mechanisms. First, it reduced Unemployment Insurance payments by about $5 million in the first year after training. Second, it increased productivity, as measured by earnings changes, by $66 million in the first year. Third, this increased productivity produced other economic activity in the state, estimated at between $33 and $51 million. Fourth, assuming the Retrainee's jobs would have been temporarily lost, the estimated value of saving the jobs was between $172 million and $257 million. If these jobs had been permanently lost, the value of saving them was over $940 million. Thus, depending on the assumptions employed, the economic impact ranged from $71 million to $1.1 billion in the first year after training. These results are particularly striking given that the cost of the training studied was $64.8 million. Using estimates from Lillard and Tan (1985) that increased productivity persists to some degree over twelve years, Moore and Blake estimate that the direct effect of ETP training on earnings alone create a long-term additional impact of $323.5 million.

Moore and Blake conclude that it is the unique characteristics of ETP training, particularly its policy of only paying for training if trainees are placed and retained for 90 days on a related job, that accounts for its outstanding performance.

ETP: A Brief History

The Employment Training Panel was created by the state legislature in 1982 as part of several reforms within the California unemployment insurance system. The ETP program was unique in that it did not set up another set of training institutions, but instead relied on contracting with existing training institutions and, most importantly, private companies, to provide training. ETP training was also unique in that it was set up to be 100% performance based. This means that ETP only pays training providers for participants who complete training and are retained on a related job for 90 days. At the time, this was a radical departure from most public training programs, which paid training providers for the participants they enrolled, but seldom linked payment to outcomes. Since that time, other training programs, notably JTPA, have moved to a more performance driven model.

The primary original objective of ETP was to use its training fund to prevent or limit unemployment, by moving the unemployed quickly into new jobs or by saving the jobs of workers threatened with displacement. Since then the mission of ETP has been broadened.

In 1989, Assembly Bill 28 expanded the focus of ETP. Besides reducing and preventing unemployment, ETP is also charged with improving the competitiveness of California by improving the productivity of its workers. The bill called for an increased focus on the needs of small businesses, those with less than 250 employees. The bill also required that ETP improve its coordination with other training agencies.

ETP is supported by contributions to the Employment Training Fund. Each California Employer who participates in the Unemployment insurance system contributes .01% of wages subject to unemployment insurance tax to the fund. This generated over $132 million for ETP in fiscal year 1992-93. During the 1992-93 fiscal year, the panel approved 236 training projects for a total cost of $91 million, which should serve 52,000 trainees during the year (Employment Training Panel, 1993).

In 1993 Senate Bill 96, which reauthorized ETP, intensified the focus on training as an economic development tool. The legislation "finds and declares" that:

> California's economy is being challenged by competition from other states and overseas. In order to meet this challenge, California's employers, workers, labor organizations, and government need to invest in a skilled and productive workforce, and in developing the skills of frontline workers. (Division 3, Part 1, Chapter 3.5, Section 10200)

The legislature directs the panel to achieve this goal by requiring that the panel give priority to projects which:

> Result in the growth of the California economy by stimulating exports from the state, and the production of goods and services that would otherwise be imported from out of state. (section 10200)

This in essence requires that the panel focus on funding projects within what economists call "basic industries," because it is these industries which generate a multiplier effect when they expand, by increasing the economic activity among local suppliers and generating additional jobs. The legislation also gives priority to projects that create "high performance workplaces". This usually means supporting training that is part of the company's effort to infuse new production techniques such as Total Quality Management (TQM), Just-in-time Delivery (JIT), or Statistical Process Control (SPC) into the production system.

Study Objectives

As the brief history of ETP shows, the program itself has experienced many changes. The years covered by this study were ones in which ETP was confronted by an economy undergoing rapid change and caught in the beginning of a severe recession.

During this century the California economy has moved from an agriculture and extraction-based economy to one dominated by manufacturing, business, services, professional, and personal services. Tomorrow California may be dominated by entertainment, communication, high tech manufacturing, international trade and finance, and medical equipment and services, among others. Economic transformations usually occur gradually and are facilitated by the areas of growth attracting new workers, while natural attrition reduces the workforce in the contracting industries. But, episodes of rapid structural transformation do occur, and usually involve the rapid growth of an industry or two, such as the rapid growth of the oil industry, the computer and microchip industry, Pacific rim international trade, and the defense industry expansion. These episodes spawn local economic booms, spurts of immigration, and local commercial and residential building binges. Not unlike California in the mid-1980s.

However, during the period studied here, rapid structural change in California's economy has occurred during the worst recession the state has experienced in several decades. The concurrent timing of the structural change and the severe recession is no coincidence. Defense contracts and spending in California peaked in the 1985-88 period and have declined over 20 percent since then. Defense-related manufacturing employment began to decline immediately, but the other manufacturing and construction sectors continued to grow along with trade and service employment to produce overall nonagricultural employment growth in California which peaked in mid-1990.

Employment began to decline with the onset of the national recession of 1990-91 and the California recession of 1990-1993. (Marking the end of the California recession as 1993 optimistically assumes that the early signs of economic expansion observed in first quarter 1994 will continue.) Unemployment in the state virtually doubled, from its low of 5.1 % in 1989 and in mid-1990 to the high of near 10 percent in 1992, where it stayed until late 1993. The February 1994 unemployment rate stands at 9.0 % and offers hope of continuing decline.

California's severe recession masks a structural transition evidenced by the differential rates of job loss for the mid-1990 to 1993 period: jobs declined 30% in aerospace manufacturing, 20% in construction, 9% in nonaerospace manufacturing, 7% in wholesale and retail trade, but jobs grew nearly 3% in services during the same period, with health care and the entertainment sectors leading the growth. The job losses compare to an overall 4.7% decline in California jobs. These differential job loss rates signal a structural shift that will probably continue as California emerges from the recession. People in the hardest hit industries will seek jobs in other industries and occupations, for which they may need new skills. People who stay in the hard hit industries will want to upgrade their skills to sharpen their competitive edge in a contracting industry.

The key goal of this study was to see if, given the shifting economic conditions and policy changes, ETP training continued to have the same success found in earlier studies, and to pull from the results implications for Panel policy.

Essentially, this study examined the impact of ETP training on a new group of ETP trainees, those trained in 1990-91, in the year after training, and estimated the impact of this training on the California economy. In addition, the study tracked ETP trainees trained in 1989-90 into their second year after training, to determine if the impact of ETP training persisted.

Specifically, this study addressed the following research questions:

1. Did the 1990-91 ETP trainees experience the gains in employment and earnings found in earlier cohorts?
2. What individual and program characteristics were associated with increases in earnings?
3. What impact did ETP training in 1990-91 have on the California economy?
4. What were the average changes in earning and employment for each ETP project which was completed in 1990-91? (Reported in a separate document, 1990-91 ETP Project Outcomes.)

5. Did the earnings and employment gains that were found for 1989-90 trainees persist into the second year after training?

Methods

The methods used essentially replicate those reported in an earlier report, Does ETP Training Work? An Analysis of the Economic Outcomes of California Employment Training Panel Programs (Moore and Blake, 1992).

Study Population

To avoid sampling error, the study attempted to include the universe of ETP participants who were enrolled in ETP programs that ended between July 1, 1989 and June 30, 1991. The study population was then divided into two cohorts: the 1989-90 cohort, which was studied in 1993, included all trainees served by projects which ended in the 1989-90 fiscal year. The 1990-91 cohort, which included all trainees served by projects which ended during the 1990-91 fiscal year, is the primary focus of this study.

A review of ETP data bases found 46,946 trainees in the 1989-90 cohort, and 41,959 in the 1990-91 cohort.

Data Sources

Four data sources were tapped to create a complete data set for each subject:

- ETP trainee files, which contained demographic data, enrollment and termination dates for each participant;
- ETP project files, which contained additional data on each project;
- Unemployment Insurance (UI) records from the California Employment Development Department (EDD), which contained the number of UI claims and the amount of UI payments made to each participant; and
- Quarterly earnings records from EDD, which contained payroll tax reports with the quarterly earnings of each participant.

Analysis

Data from these sources were merged to create a data base for analysis. Four measures of employment and earnings were calculated for each case:

> **Annual earnings before training (unadjusted and adjusted):** trainees' total earnings in dollars for the four complete quarters prior to enrolling in ETP training. These earning were "adjusted" for inflation using the Consumer Price Index for California, into 1990 dollars so that changes in real earnings could be measured. All measures of earnings are reported separately.
>
> **Annual earnings after training Year 1 and Year 2 (unadjusted and adjusted):** trainees' total earnings in dollars for the four complete quarters after leaving ETP training. These earning were "adjusted" for inflation using the Consumer Price Index for California, into 1990 dollars so that changes in real earnings could be measured. All measures of earnings are reported separately.
>
> **Unemployment insurance claims and unemployment insurance payments before training:** trainees' total number of weeks receiving unemployment insurance, and total dollar value of unemployment insurance payments in the four complete quarters before enrolling in ETP training.
>
> **Unemployment insurance claims and unemployment insurance payments after training:** trainees' total number of weeks receiving unemployment insurance, and total dollar value of unemployment insurance payments in the four complete quarters after leaving ETP training.

While this study employs a method similar to that used in earlier evaluations of ETP (Moore and Blake, 1992), two important changes were made. In the earlier study, EDD calculated the earnings in the years before and after training from quarterly wage records. This year the project received the quarterly wage records of each individual trainee.

Defining a Complete Earnings Year

When annual earnings were calculated for the 1989-90 group, which had been studied before, systematic differences in earnings were found. An analysis of the differences revealed that when EDD had calculated the earnings in the years before and after training, they only included a single record for each trainee for each quarter. This approach assumed that each trainee would have only one employer each quarter. In fact, trainees often have multiple employers because they change employers during a quarter, or they work second or even third jobs. In this analysis, we included all earnings, thus generating higher post training earnings than reported earlier.

In calculating the earnings in the year before training, EDD included the quarter in which the trainee entered training. This method meant that part of the training period was included in the year before calculation. To insure that the before training earnings accurately represented the labor market experience of trainees, we excluded the quarter in which they started training and went back four quarters before that quarter. Again, this produced slightly different pre-training earnings figures for some groups, but in our view improved the accuracy of the data.

Data on the earnings changes calculated for each project were reported to ETP under a separate cover.

Limits Of The Study

While this study is rigorous and employs research methods commonly accepted in the social sciences, it has limits which the reader must consider while interpreting the results.

First, like other quasi-experimental studies of this type, it lacks a randomly selected control group -- that is, a group of individuals who are exactly like those trained by ETP programs, but who did not receive training. Instead, this study compares participants who completed training with dropouts. Beyond their measured background characteristics, which are controlled for statistically in the model, the degree to which dropouts and completers may differ is unknown. Completers may differ systematically from dropouts in their personal characteristics. Completers, for example, may be more motivated, or better adjusted to the training experience. Moreover, we do not know how much training the dropouts may have received. They may have attended only a day of training, or they may have completed training but failed to complete the 90 day retention period on the job. The fact that the dropouts may have received substantial benefit from training may minimize the measured impact of training.

Second, as noted earlier, a large proportion of ETP trainees could not be included in the regression models because ETP records lacked data on the participants, backgrounds. While the available data indicates that these trainees were not radically different from those included, they may still differ in some undetected systematic manner which may skew the results.

A third limit may be in the measurement of pre-training earnings. In his review of CETA studies, Barnow (1986) noted that earnings of displaced workers tended to drop before training. This pre-training dip in earnings was because workers were unemployed before training, thus raising the question of whether using income for the year before training accurately measures trainees' real labor market value. The pre-training dip is not relevant for the Retrainees, who are employed at the time of training and who constitute 95% of our study population. The pre-training dip for New Hires was underestimated because earnings and employment were measured for the four full quarters before enrolling. By doing this, we did not capture some period of unemployment for each New Hire, since we did not include partial quarters. For example, if a New Hire enrolled in a program in February, we went back to December 31 and then took the four previous quarters, thus missing the period of unemployment in January and February.

A final caveat must be applied to all multiple regression models such as those used here. The models are capable of measuring unique relationships between variables as correlations; however, these relationships are not necessarily evidence of cause-and-effect relationships. Also, these models are subject to shrinkage, which simply means that when applied to other populations, such as trainees from 1992, they may have less predictive power.

Results: 1990-91 Trainees

This section examines the outcomes for trainees in the 1990-91 cohort. Specifically, it analyzes completion rates, characteristics of completers and dropouts, patterns in UI weeks and payments, and annual earnings pre and post-training.

Program Completion

The first measure of ETP training outcomes is trainees, success in completing the training. The requirements for successful program completion are stringent. A trainee is considered to have successfully completed training if that person is placed in a job related to training and remains employed for 90 days. A person who begins ETP training and is not placed and on the job after 90 days is considered a "dropout". For classification purposes, it does not matter whether the person completed the training portion of the program; was placed, but left before 90 days; completed training but did not get placed; or the person dropped out of the training portion of the program early on. All of these cases are considered dropouts.

Overall, 74.2 % of the people who began ETP training completed, were placed, and remained on the job for at least 90 days. The percentage of completions were approximately the same for both the Retrainees and for the New Hires in the 1990-91 cohort. Retrainee participants completed at a 74.3 % rate, while New Hires completed at a slightly lower 73.1% rate (See Table 1).

The 1990-91 cohort completion rate is comparable to that achieved by the 1989-90 group. The overall 1990-91 completion rate was 74.2%, compared to a 78.0 % rate for the 1989-90 trainees. The completion rate for the Retrainees fell a little, from 78.4 % in 1989-90 to 74.3% in 1990-91, while the completion rate for the New Hires rose from 69.2% in 1989-90 to 73.1% in 1990-91.

Table 1
All 1990-91 Trainees by Eligibility Category and Outcome

	Retrain	New Hire	Total
Complete	74.3% (29,586)	73.1% (1,545)	74.2% (31,131)
Dropout	25.7 (10,260)	26.9 (568)	25.8 (10,828)
Total	100.0 (39,846)	100.0 (2,113)	100.0 (41,959)

Appendix A displays the demographic characteristics of trainees who completed training and those who dropped.

Appendix C compares the characteristics of Retrainees and New Hires. Overall, Retrainees were more likely to be female, white, older, and more highly educated than New Hires. Conversely, New Hires were more likely than Retrainees to be male, black or Hispanic, younger, and less educated.

UI Payments and Weeks

Changes in the employment or unemployment status of the ETP training program participants are another measure of program impact. Weeks of unemployment as measured by UI claims were recorded for trainees in the year prior to training and the year after training. Comparisons of the average number of weeks of UI claimed before and after training reveal the expected pattern of changes among the various trainee groups (see the following graph). Retrainees who completed training experienced low unemployment before training and low unemployment afterward. Retrainees who dropped out had low unemployment before training and experienced a significant increase in unemployment after dropping out. New Hires who completed dramatically decreased their unemployment from the high levels they experienced before training. The New Hires who dropped out of training experienced somewhat lowered unemployment after training relative to their high before levels, but remained at an average 9 weeks unemployment in the post-program year(See Table 2). The experience of each group is detailed and compared to its 1989-90 cohort group below.

The 1990-91 Retrainees who completed training experienced a fraction of a weeks, unemployment in the year prior and a fraction of a week in the year after. The average rose somewhat from before to after, but this rise is probably more reflective of worsening trends in the California economy over this time period than of any consequence of the training. It is important to remember that employees eligible for retraining under ETP guidelines are in jeopardy of being laid off. Given recent trends in the California economy, some of the trainees were probably laid off despite successful retraining.

The change in UI weeks claimed for 1990-91 Retrainee completers follows the same pattern as it did for the 1989-90 cohort. However, the rise in unemployment is less for the 1990-91 cohort. This year's group starts at a slightly higher UI weeks claimed rate (.36 weeks relative to .32 for the 1989-90 group) and rises to a slightly lower rate (.73 weeks relative to .77).

Retrainee dropouts experienced low unemployment before training (.54 weeks) but quadrupled their unemployment rate in the year after training (rising to 2.16 weeks). These dropouts obviously experienced significantly higher unemployment after training than did the Retrainee completers. The 1990-91 dropouts also had a somewhat higher post-year average level of unemployment and a higher pre-to-post-year average rise in weeks of unemployment compared to the 1989-90 cohort.

The 1990-91 New Hire completers experienced a very dramatic decrease in unemployment, with their weeks of unemployment falling to roughly 1/10 of what it had been. They averaged 11.62 weeks in the prior year, in contrast to 1.54 weeks of unemployment in the post year. The 1990-91 New Hire completers started at a higher level of unemployment than their 1989-90 cohorts and dropped farther. The 1989-90 cohorts had prior-year unemployment level at 9.79 weeks and dropped to 2.34 weeks unemployment in the year after.

The 1990-91 New Hire dropouts experienced somewhat higher unemployment (13.07 weeks) in the prior year than the New Hire completers did. Their drop in unemployment was also much less dramatic, falling only to 9.10 weeks in the year after training. This was, however, a larger drop than was experienced by the 1989-90 New Hire dropouts who fell only 1.62 weeks from 9.28 weeks in the prior year.

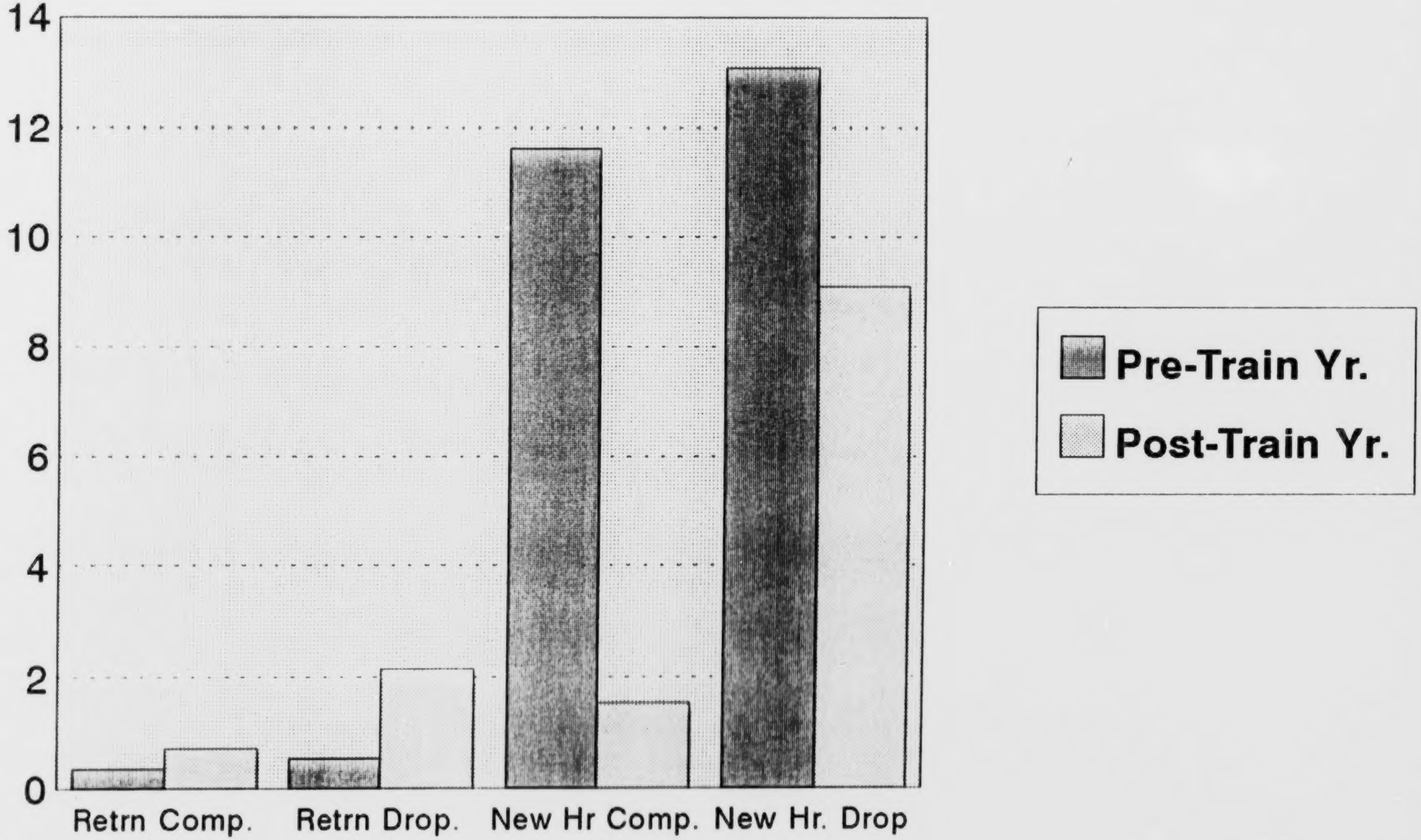
The average UI payments to the four groups largely reflects the differing patterns of pre- and post-year unemployment experienced by these groups. There are some noteworthy differences which are detailed in Table 2.

The 1990-91 Retrainee completers had low UI payments in the year prior to training and had low UI payments in the year after. The average annual payment to this group was $46.12 in the year prior to training, and went to $110.30 in the year following training. These payments reflect the fractions of weeks of UI claims experienced both before and after training. While the average annual payment did increase by $64.18, the average weeks of UI claimed and the average UI payments grew in the California economy during the same time period. Compared to 1989-90 ETP Retrainees, the 1990-91 group had a smaller increase in claims from the year before training to the year after.

The 1990-91 Retrainee dropouts also experienced low UI payments in the year prior to training, although, at an annual average of $66.83, their average was somewhat higher than the completer group. Unlike the completers, though, the dropouts experienced considerable increase in UI payments between the prior and post years. At $324.50 annual average payment, the average dropout drew over $250 more in UI payments in the post year, or around five times what they drew prior to training. These UI increases reflect roughly the increase in weeks of unemployment for this group, although the payments do increase somewhat more than the weeks claimed.

The 1990-91 Retrainee dropouts also did somewhat worse than 1989-90 Retrainee dropouts in that their UI payments started lower and went up more than they did for the comparable group in 1989-90.

1990-91 Trainees
UI Weeks Pre and Post Training



California State University, Northridge ETP Outcomes Project 1992-93

Table 2
1990-91 Trainees
Unemployment Payments and Claims by Dropouts and Completers
(All Trainees N=37,834)

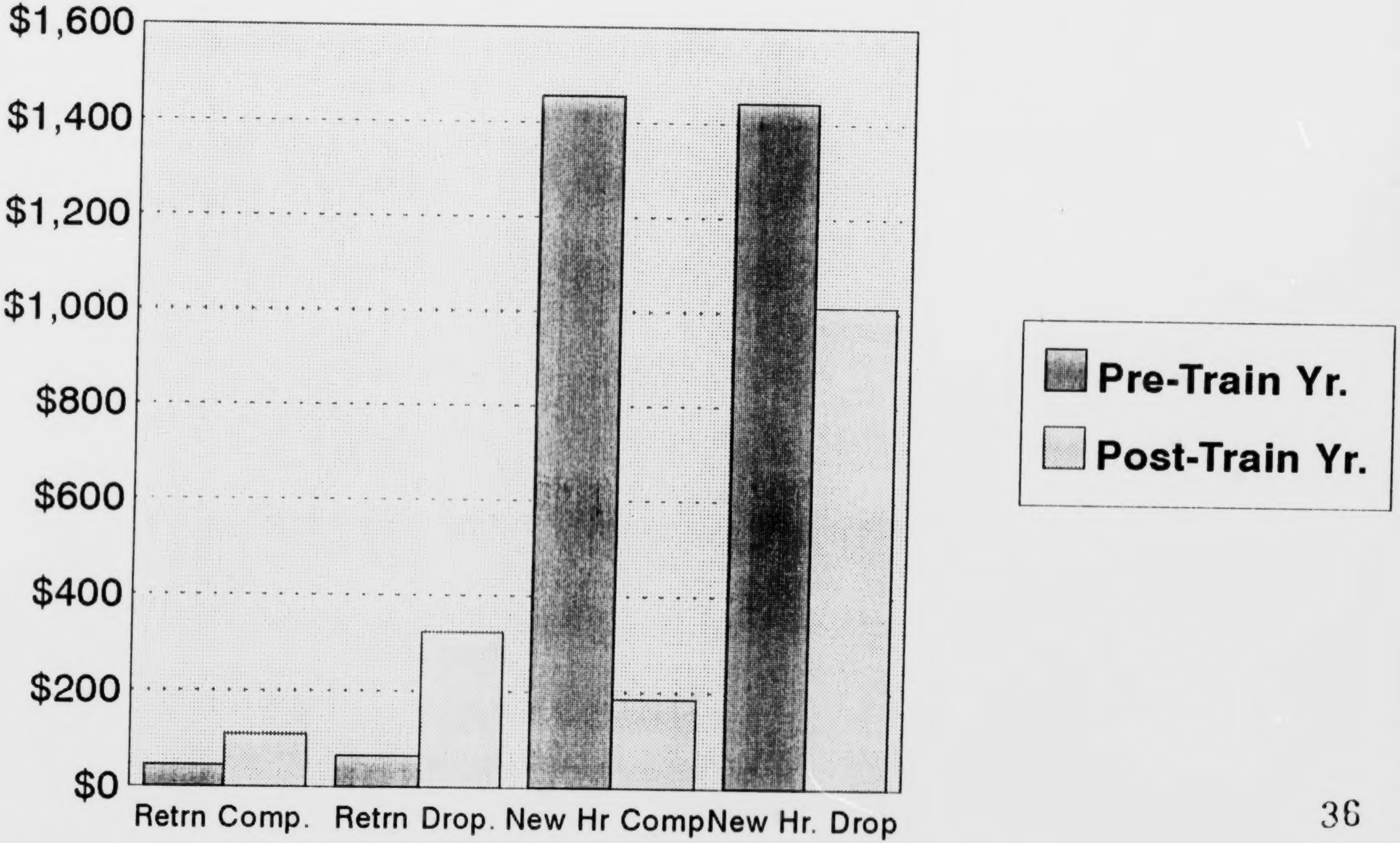
	Avg. UI claims before training	Avg.UI Claims after training	Change in UI claims
Retrainees			
Completers	.36	.73	+.37
Dropouts	.54	2.16	+1.62
New Hires			
Completers	11.62	1.54	-10.08
Dropouts	13.07	9.10	-3.97

	Avg. UI Payments before training	Avg. UI Payments after training	Change in UI Payments
Retrainees			
Completers	$46.13	$110.30	+$64.17
Dropouts	66.83	324.50	+257.67
New Hires			
Completers	1456.85	187.07	-$1269.78
Dropouts	1444.31	1013.43	-430.88

As expected, 1990-91 New Hire completers had substantial UI payments in the year prior to training, with an annual average of $1,457. These payments dropped dramatically in the year after training, to an average of $187, for a drop of $1270. This drop obviously reflects the similar drop in the weeks of UI claimed between the prior and the post year. This dramatic drop is also larger than the decreased UI payments experienced by the 1989-90 New Hire completers. The 1989-90 New Hire completers had UI payments of about $200 less in the prior year and ended up with over $100 more UI payments in the post year than the 1990-91 group.

The 1990-91 New Hire dropouts had prior year UI payments comparable to those who completed training, but experienced a negligible drop in UI payments in the post year. With a prior-year payments at $1,444 and post-year payments at $1,013, these dropouts experienced a decrease of only $430 in annual payments.

1990-91 Trainees
UI Payments Pre and Post Training



California State University, Northridge ETP Outcomes Project 1992-93

Annual Earnings Pre and Post Training

The change in earnings experienced by the ETP training program participants is another measure of the training program's impact. Economic analysis indicates that wage levels are related to worker productivity in competitive labor markets. This implies that training programs that produce changes in worker productivity ought to produce changes in wages. Since the ETP training programs are designed to enhance worker productivity, it is reasonable to expect that successful completion of training will result in higher wages for the completer. We also expect that the training program completers will have a greater change in earnings due to the program than those who drop out.

As mentioned before, ETP trainees must be trained, placed on the job, and remain for at least 90 days to qualify as program completers. ETP dropouts include trainees who completed formal training, were placed, but did not remain for 90 days, as well as people who received training but were not placed. In some cases, the "dropouts" may be workers who completed training, placement, and almost 90 days on the job, but then left to take advantage of a better offer. We do not believe that this would be the average dropout, but we do expect some portion of the dropouts to benefit from training about as much as the completers do. On average, though, the dropouts probably experience some increase in productivity due to the portion of the training program they experience and will reap the resulting increase in earnings.

The earnings data reported on Table 3 are subject to an additional caveat, which is that these data represent ETP training completers and dropouts for whom we could locate a complete four quarters of UI data both prior to and subsequent to training. People who did not appear in the records for the requisite amount of time were omitted from the study and are not represented in the data. This means that the earnings data reported below pertain only to those people with a full four quarters of UI covered labor market participation subsequent to the training program. To the extent that some of the dropouts dropped out of the labor force as well as the training program, the reported earnings would overstate the average outcome for all of the group.

We report two different sets of earnings data. The unadjusted earnings are simply the recorded earnings taken from the UI wage records. These data are often called "nominal" earnings because they are the actual payments regardless of when these payments were made. When comparing payments made in different years, nominal payments are frequently adjusted to "constant dollars" or "real dollars" to remove the effects of inflation from the data. Since the earnings reported here range from 1987 to 1992, the "adjusted" or "real" earnings are free from any bias introduced by changing price levels.

Our analysis, reported in Table 3, of the pre-and post-training earnings of the trainees is consistent with expectations. Earnings of program participants rise for all participants, but substantially more for completers than for dropouts. The largest group -

- Retrainee completers -- earn substantially more after training than they did before, and their gain remains substantial after adjusting for inflation. The New Hire completers experience the most dramatic increase in earnings. In part, this results from lower earnings in their pre-training year due to significant spells of unemployment, but after training the New Hire completers earn a very respectable average of $21,166 measured in 1990 dollars. Both of the training dropout groups experienced some increase in earnings from the prior to the post year, but their gains were small compared to the program completers.

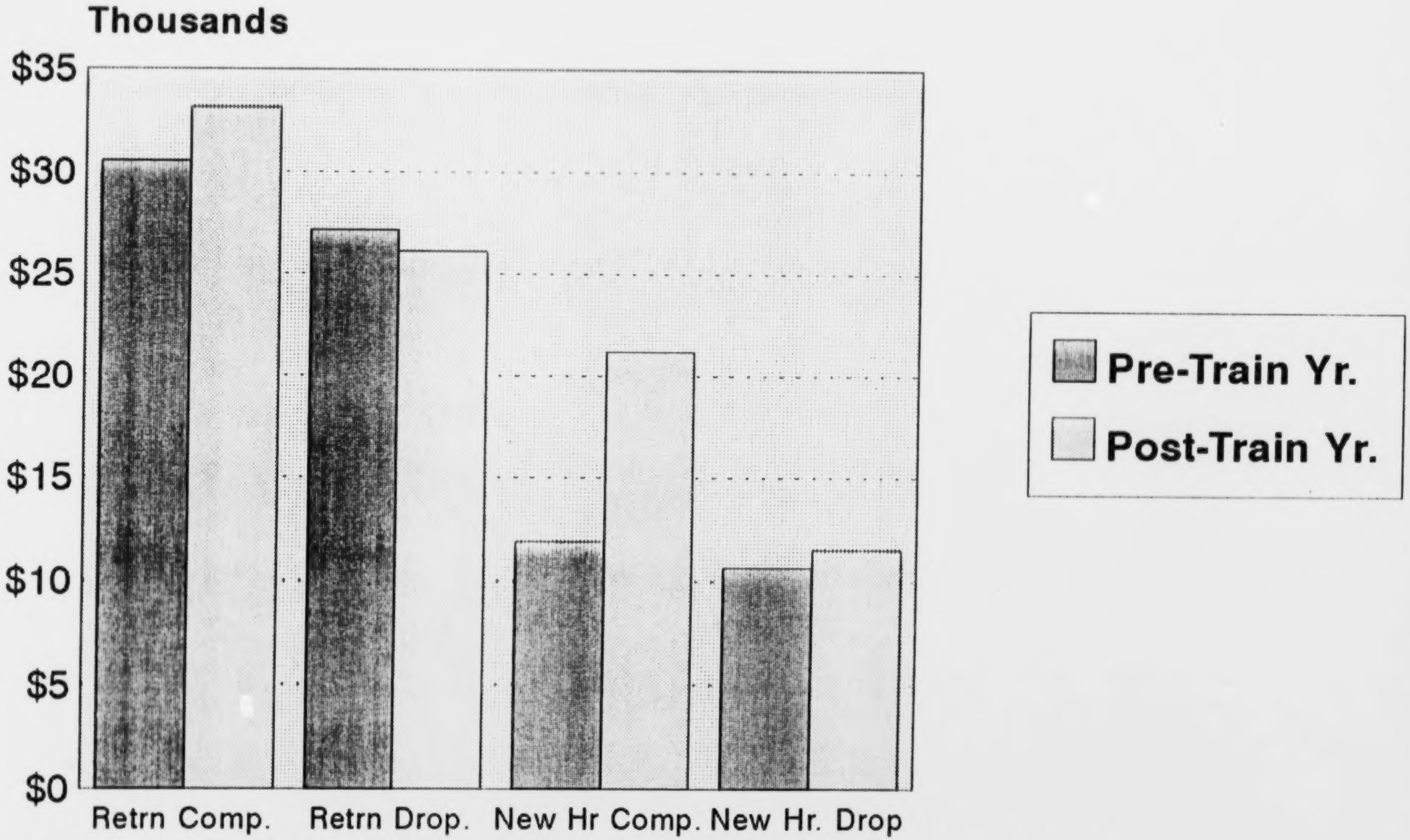
The Retrainee completers averaged $29,160 in the year before training and $33,738 in the year after, for a gain of $4,578 in nominal dollars. Stated in 1990 dollars, this becomes $30,504 before and $33,125 afterwards, for an impressive real gain of $2,621 or 8.6 %. This real gain for the 1990-91 Retrainee completers is over $1,000 more in real terms than the $1,615 experienced by the corresponding 1989-90 group. In percentage terms, the 1990-91 Retrainee completers gained 8.6 % in real earnings compared to 6.0 % for the corresponding 1989-90 trainees.

The Retrainee dropouts fared substantially worse than the completers. Unadjusted earnings for this group show $25,889 before training and $26,689 afterwards. But when adjusted for inflation, the before earnings become $27,122, compared to $26,454 after training, revealing a real decline of $668 or -2.5 %. Despite the decline, the 1990-91 Retrainee dropouts did better than the comparable 1989-90 group, who experienced an 8.1 % decline from the year before to the year after as their real earnings fell by more than $2,000.

The New Hire completers experienced a huge increase in nominal earnings, going from $11,376 before training to $21,484 afterwards, a gain of $10,108. Adjusting the nominal earnings for inflation did not modify the large increase experienced by the New Hire completer, whose real earnings were $11,883 before training and $21,166 afterwards, for a very impressive real gain of $9,283 or 78.1%. In this regard, the 1990-91 New Hire completers outperformed this similar 1989-90 group whose real gains were $7,400, which was a gain of just over 60 % of their previous year's real earnings.

The New Hire dropouts experienced a relatively modest earnings gain, from $10,173 before training to $11,666 afterward. In real terms, the before earnings were $10,648 compared to $11,541 afterwards, a real gain of $893 or about one-tenth of the gain experienced by the New Hire completers. The small gains experienced by these training dropouts, however, do compare favorably with those of the comparable 1989-90 group, whose earnings dropped in real terms by over $2,000, for a real income loss of more than 18 %.

1990-91 Trainees
Adjusted Earnings Pre and Post Training (1990 Dollars)



California State University, Northridge ETP Outcomes Project 1992-93

Table 3
1990-91 Pre and Post-Training Earnings Adjusted and Unadjusted
(All Trainees N=38,241)

	Pre-training Annual Earnings	Post-training Annual Earnings	Change In Annual Earnings	% Change Annual Earnings
Unadjusted				
Retrainees (N=36,474)				
Completers (N=27,444)	$29,160	$33,738	+$4,578	+15.7%
Dropouts (N=9,030)	25,889	26,689	+ 800	+ 3.1
New Hires (N=1,767)				
Completers (N=1,342)	11,377	21,484	+10,107	+88.8%
Dropouts (N=425)	10,173	11,666	+1,493	+14.7%

Table 3 (Cont.)
1990-91 Pre and Post-Training Earnings
Adjusted and Unadjusted
(All Trainees N=38,241)

	Pre-training Annual Earnings	Post-training Annual Earnings	Change In Annual Earnings	% Change Annual Earnings
Adjusted to 1990$				
Retrainees (N=36,474)				
Completers (N=27,444)	$30,504	$33,125	$+2,621	+ 8.6%
Dropouts (N=9,030)	27,177	26,122	-1,055	- 3.9%
New Hires (N=1,767)				
Completers (N=1,342)	11,883	21,166	+9,283	+78.1%
Dropouts (N=425)	10,648	11,542	+ 894	+ 8.4%

Multiple Regression Analysis 1990-91 Trainees

Overview

The earlier analysis showed that completers of ETP training earned significantly more than dropouts. A question remains, however: was this difference in earnings due to the ETP training, or was it due to systematic differences in the characteristics of completers and dropouts and the programs that served them? Perhaps completers were more highly educated than dropouts, or maybe completers worked in industries with higher wages.

Results reported earlier (see Appendix A) show that there were some systematic differences between dropouts and completers. Our analysis reveals that married people and people of Asian ethnicity were significantly more likely to complete training. Also males, older people, veterans, and people with some college were slightly more likely to complete training. Groups slightly less likely to complete training included females, blacks, Hispanics, whites, and people who did not graduate from high school.

Multiple-regression analysis provides a tool for measuring the unique relationship between changes in earnings and completing ETP training, while controlling for differences in demographic and project characteristics. The multiple-regression analysis presented here has two objectives:

- to identify the unique impact of completing training on changes in earnings;
- to identify the unique relationship of demographic and program variables on changes in earnings.

The variables examined in this analysis are listed in Figure 1.

Figure 1
Variables Included In Multiple-Regression Analysis

Completing Training

Demographic Variables:
- age
- gender
- marital status
- education level
- military service (veteran)
- ethnic group
- disabled
- GAIN participant

Program Variables:
- industry for which they are trained
- size of organization in which they were trained
- number of trainees enrolled

The overriding conclusion of this analysis is that completing training, by itself, has a large and highly significant impact on the change in real earnings for both New Hires and Retrainees that cannot be attributed to other differences between the two groups. In addition to confirming the impact of completing training on the change in real earnings, the regression analysis identifies other characteristics or conditions that also have significant influences on the change in real earnings. Before identifying the magnitude of completion effect and discussing the impact of other variables on earnings, the methodology of the analysis is explained and the measures of statistical significance are identified.

Regression Method

The specific variable which the regression model attempts to predict is the change in real earnings expressed in 1990 dollars. Recall that this variable is adjusted to eliminate any effects of inflation on earnings. Real earnings are obtained by dividing the reported earnings by the Consumer Price Index for California wage earners which is adjusted to a 1990 base. The change in real earnings is defined as the real earnings in the post-program year minus the real earnings of the pre-program year.

The change in real earning was regressed on the variables listed in Figure 1 to isolate the direction and magnitude of each variable's influence on the change in real earnings. Two separate regression analyses were run, one for the "New Hires" and one for the "Retrainees". This allowed for the possibility that some of the variables above would affect the group of New Hire trainees differently than they affected the Retrainees, which was the case in several instances.

The analysis produced three key statistical measures which are reported here. First, the adjusted R^2 statistic indicates the percent of the total variation in the change in real earnings which is "explained" by the variables in the model. This statistic measures the explanatory power of the model, which is the extent to which the total observed variation in the dependent variable (change in real earnings) is correlated with variations in the independent variables (those identified in Figure 1).

Next is a regression coefficient, expressed in dollars. This statistic indicates the unique contribution of each unit of the independent variable to changes in real earnings. This measure may be positive or negative. Thus, a coefficient of -\$132 for age (in the New Hire analysis) indicates that for every year older a person is, his or her change in earnings would be \$132 less than for a younger trainee with otherwise similar characteristics. Similarly, in the analysis of Retrainees, the \$1,484 coefficient for being a high school graduate indicates that the unique effect of completing high school (relative to not completing high school) added \$1,484 to the change in real earnings.

Finally, in parentheses under the regression coefficient is the standard error of the coefficient. This number, also in dollars, is used to generate statistical confidence intervals around the estimated coefficient. In a normal distribution, two-thirds of the observations fall within one standard error of the coefficient, 95 % within two standard errors, and 99 % within three standard errors of the estimated coefficient. These probabilities are used to generate "confidence intervals" around the estimated coefficient. For example, in the case of the age variable for New Hires, the confidence interval indicates that the estimated impact of age fell within one standard error of the estimated coefficient in two-thirds of the cases. That is, in two-thirds of the New Hire cases, the estimated impact of age fell between -\$101 and -\$163. A confidence interval containing 95 % of the cases would extend two standard errors above and below the estimated coefficient, or the interval from -\$70 to -\$194 would capture the age effect for 95 % of the New Hire cases.

We indicated the statistical significance of each coefficient in the estimated relationships with a series of asterisks. Statistical significance indicates the probability that the estimated regression coefficient is not equal to zero. Specifically, the regression analysis uses the estimated coefficient, the standard error, and the "confidence intervals" to calculate levels of probability. The probability indicates the likelihood that the "true coefficient" lies within a specific confidence interval around the estimated coefficient. If that confidence interval does not contain zero, then the coefficient is said to be significantly different from zero at the level of probability indicated. Most studies use a five and/or a one percent confidence interval, indicating there is a one or five in 100 chances that zero is contained in the confidence interval. To minimize the possibility of identifying a coefficient as not equal to zero when it really is, this regression analysis uses a confidence interval which corresponds to one percent or less; this means that the coefficient is considered to be significant only if the probability is 99 percent or greater that the coefficient is not equal to zero.

Tables 4 & 5 contain the results of the regression analysis for both New Hires and Retrainees. The coefficients marked with an asterisk are highly significant, with the probability of 99 percent or greater that the coefficient is not equal to zero. It is especially important to note that the coefficients without asterisks can be considered to be zero, regardless of the numerical value listed. The absence of an asterisk indicates that the identified variable has no statistically significant relationship with the real change in earnings.

Regression Results: Power of the Analysis

Tables 4 & 5 report the estimated coefficients for the regression analysis (with the standard errors of the estimates in parentheses below). The number of observations (N) and the adjusted R^2 (the observed variation explained by the analysis) are shown for the New Hires and the Retrainees.

As Table 4 indicates, the New Hire model explained about 39.6% of the variance in the change in real earnings, while the Retrainee analysis (Table 5) explained 12.2% of the variance. Both these estimated relationships are highly statistically significant and it is unlikely they are due to chance. The percent of variation explained for the Retrainee equation is well within the range of similar studies, (see for example Grubb (1991)), and the New Hire regression has a much higher explained variation (adjusted R^2) than most similar studies. The unexplained portion of the variance may be related to : 1) factors not measured by this study, such as the personality characteristics of participants or the type of trainer; or 2) factors measured by the study for which the measurements are not adequately refined, such as the five categories of education or the four categories of business size; or 3) there may be simply random variation in the dependent variable. Additional data would have probably added to the explanatory power of this analysis. For example, a more refined classification of the industry in which training occurred or the occupational classification for which the people were trained might have increased the explanatory power. Training results may vary systematically by the type of trainer or by other parameters that were not measured. The amount of variation explained also would have been higher if complete data were available for all trainees.

The fact that the New Hire relationship has a much higher explained variation than the one for the Retrainees is probably due to the more homogeneous experience of the New Hires. The New Hires were all unemployed at the initiation of training and self-selected to participate, whereas the Retrainees were all currently employed but in a variety of industries and occupations and were selected by their employer to participate. Bear in mind, though, that the lower explained variation of the Retrainee model in no way detracts from the significant influence that the examined variables had on the change in real earnings.

The case for the New Hires having a more homogeneous experience in ETP training programs is also reflected in the results of the regression analyses of the two groups. The fact that the regression analysis for Retrainees had more independent variables that significantly influenced the change in real earnings is further evidence of the more homogeneous experience of the New Hires. That is, the amount of the change in real earnings experienced by the Retrainees depended much more on the demographic characteristics and programmatic variables than it did for the New Hires, who experienced a more uniform change in real earnings. The greater number of statistically significant variables for Retrainees occurred mainly with the educational attainment, the industry of employment, and the business size variables.

Impact of Training and Completion

The key question this analysis addresses is, what was the impact of completing ETP training on changes in earnings? The regression analysis indicates that completing ETP training has a large, positive, and statistically significant impact on the earnings of New Hires and Retrainees. The value of completing training for New Hires, independent of all other variables, was $12,209 of increased real earnings. For Retrainees the effect of completing training was $8,845. In both cases, the coefficient is highly significant, with narrow confidence intervals, indicating that these increased real earnings are not due to chance.

To interpret these figures we need to consider the value of the intercept and the average value of other significant variables. The intercept value at the top of Tables 4 & 5 can be carefully interpreted as revealing the influence of enrolling in training (without completing), when evaluated at the zero or base level of the other independent variables.

The intercept for New Hire regression is not significantly different from zero, but the coefficient for completing training is large and highly significant. This means that enrolling in training probably had no significant influence on the earnings of New Hires but that completing training boosted a New Hire's earnings by $12,209, minus an adjustment for the participants, age at the beginning of training. For a 30 year-old New Hire, this would put the effect of completing training at $12,209 minus $3,960 (-$132 x 30), or at about $8,249 in the first complete year after training. This effect of completing training for a 30 year-old New Hire in 1990-91 is very close to $8,389 which, is the difference between the real earnings gain of New Hire completers and dropouts reported in Table 3 ($9,283 for completers minus $894 for dropouts).

The intercept for the Retrainee model is statistically significant and negative, which has subtle but meaningful implications. This intercept is more difficult to interpret because there are more statistically significant effects here than in the New Hire model. The negative intercept means that simply enrolling in training but not completing training would probably result in a negative change in real earnings. The negative intercept (-$5,574) combined with the age effect (the average age of 35 times -$140, or -$4,900) yields a total of -$10,474, which is larger than the combined positive effects of education, the size of the firm, and the industry in which the training occurs. This reinforces our earlier result that Retrainee dropouts on average experienced a decrease in real earnings. On the other hand, the completing training has a large positive effect ($8,845) which, combined with the positive effects for four out of five levels of education, most industry categories, and business size categories, overwhelms the negative intercept to produce an average predicted increase in real earnings of close to $3,000. This compares to the earlier reported average of $2621 increase in earnings for Retrainees completers, which was developed by comparing before and after training earnings. Thus, both of the regression equations produce predicted increases in real earnings that are consistent with the earlier estimates of the impact of training.

New Hire Regression Results: Demographic Variables

Tables 4 & 5 provide data for each variable in the New Hire and Retrainee analyses. Only a few demographic variables proved to have a significant relationship with changes in earnings for the New Hires. This finding has interesting implications for the nature of the New Hire training, which are discussed below.

The age of the trainee had a significant influence on the change in real earnings for the New Hires. The change in earnings fell $132 for every year older (over 18) the trainee was. This indicates that New Hire training is slightly more productive for younger workers.

The New Hire trainees' educational attainment had little impact on their change in real earnings. To gauge the effect of educational attainment, the participants were grouped into the following categories: less than high school graduation, high school graduation, some college experience, college graduation, and some post-baccalaureate experience. The group that did not graduate from high school was used as the base group and the coefficients for the other groups show the effects of the indicated levels of education relative to not having graduated from high school.

Table 4
Regression Models For Predicting Change In Adjusted Annual Earnings
New Hire
(N=1,336)

Variable	Coefficient (Standard Error)	Adjusted R2=.396
Intercept	$8,341 (5,828)	
Complete Training	12,209*** (668)	
Age	-132*** (31)	
Gender (Female)	-735 (758)	
Marital Status (Married)	-80 (635)	
Gain	937 (3,464)	
Disabled	5,856 (4,894)	
Education		
< H.S.	Base	
H.S. Grad	-1,140 (1,446)	
Some Coll.	-827 (1,538)	
Coll. Grad.	-4,700* (1,881)	
Post Bacc.	-4,663	

(2,802)

Table 4 (Continued)

Variable	Coefficient (Standard Error)
Ethnicity	
White	Base
Black	3,358** (894)
Hispanic	2,926** (836)
Indian	2,841 (4,911)
Asian	1,476 (981)
Other	794 (2,349)
Missing	-1032 (2,299)
Veteran	-404 (846)
Program Characteristics	
Number in Program	-.61 (1.18)

Table 4 (Continued)

Variable	Coefficient (Standard Error)
Industry	
Agriculture	-8,086 (4,239)
Construction	-20,149** (5,741)
Manufacturing	-4,822 (3,707)
Transportation, Utilities	Base
Wholesale/Retail	-6,998 (3,902)
Finance, Insurance Real Estate	-2,897 (4,060)
Service	-3,952 (3,867)
Food Production	-9,610* (3,775)

Table 4 (Continued)

Variable	Coefficient (Standard Error)
Business Size	
<50	Base
51-100	-5,671 (5,343)
101-250	-8,794 (7,641)
>250	2,906 (4,228)
Not Classified	-6,408 (4,213)

* = Significant at .01,
** = Significant at .001,
*** =Significant at .0001

For the New Hires, the only educational coefficient that is significant is the one for college graduates, and it is negative. This means that a New Hire who is a college graduate would be expected to have an increase in real earnings that is $4,700 less than a New Hire who did not graduate from college. This negative coefficient means that New Hire training is approximately half as productive for college graduates as it is for people with less education. This may appear to be counterintuitive, but note that this variable is the increase in real earnings and not the level of real earnings. The New Hire college graduates start from a higher base earnings in the previous year and simply do not gain as much as other New Hire trainees. Specifically, the average earnings in the previous year for the New Hire college graduates was $16,001, compared to $11,263 for the non-college graduates. This difference of $4,738 in previous year earnings compares to the college graduate coefficient of -$4,700 and indicates that New Hire training brings both college graduates and non-college graduates up to about the same level of productivity (earnings).

This result suggests that new-hire type training, which qualifies workers for new jobs, brings all of the trainees up to the same level of productivity. More educated trainees do not seem to become more productive relative to less educated workers in the year after training. This more or less equal productivity of New Hire training completers is consistent with our regression analysis findings with other demographic and program variables.

There were two significant relationships between the change in real earnings and ethnic identity for New Hires. The ethnic categories are listed in Table 4 and the coefficient for white is excluded because this category was used as the base in both regression equations. The ethnicity coefficients should be interpreted as the change in real earnings for the indicated ethnic group relative to whites.

In the New Hire group, being black or Hispanic produced a significantly higher change in real earnings ($3,358 and $2,926 respectively) than did belonging to any other ethnic category. The greater change in real earnings for these two groups is approximately the difference between the previous year's earnings for these two groups and the average previous year's earnings for all of the other New Hires. The real earnings in the previous year averaged $9,377 for Black New Hires and $9,808 for Hispanics, compared to $13,376 for everyone else. This result is consistent with our earlier conclusion on the nature of the New Hire training, namely that the New Hire training tends to bring all the trainees who complete the training up to the same earning (productivity) level. Since the Blacks and Hispanics had lower real earnings in the previous year, they experienced a greater change in real earnings as a result of training.

The other demographic variables -- gender, marital status, whether they were veterans, participants in the GAIN program, or disabled -- had no effect on the change in earnings for New Hires.

New Hire Regression Results: Program Variables

The change in real earnings for New Hires was not greatly affected by the industry in which they were placed. In this analysis of industry effects, the transportation and communication industry was used as the base, which means that the coefficients associated with the other industries should be interpreted as the effect of the industry of placement relative to the transportation and communication industry.

The presence of only two statistically significant industry coefficients for New Hires indicates that trainees in most industry categories did not experience significantly more or less change in earnings than those in the transportation and communication industry. However, New Hires in construction and those classified as in "other industries" had significantly lower changes in real earnings compared to other New Hire trainees. Additional statistical analysis indicated that the large negative coefficient for the construction industry (-$20,149) is somewhat sensitive to the specification of the model and to the inclusion or exclusion of certain files with missing education variables. Furthermore, there were only 14 New Hire trainees in the construction industry when those with missing education variables were excluded and this is not a sufficient number to establish a true industry effect. Consequently, the effect of being in the construction industry should be considered tentatively to have a negative effect on the change in real earnings, but the magnitude of that negative effect is a question mark.

Business size did not affect the change in earnings for New Hires as indicated by the absence of significant coefficients for New Hires in this area. The category of business size with less than 50 employees was used as the base in this analysis, so the coefficients associated with the other business size categories indicate the effect on the change in real earnings of being placed in a larger business relative to one with less than 50 employees.

The result that the size of the business had no significant effect for New Hires was expected because a substantial amount of New Hire training takes place in a consortium environment where the New Hires are subsequently placed in businesses of various sizes. This is not to say that the productivity of the training for New Hires and consequently their change in earnings does not vary across the training projects, but rather that differences in the change in earnings associated with different training projects would be likely to be spread among many businesses of different sizes.

The number enrolled in the particular training program did not have any significant effect on the change in real earnings for New Hires. This indicates that there is no systematic link between the size of the training project and its impact on the change in earnings for New Hires.

We now turn to the analysis of the Retrainees, for whom many more of the demographic and program variables had statistically significant influences on the change in real earnings.

Retrainee Regression Results: Demographic Variables

The analysis of Retrainees (see Table 5) revealed many more significant demographic effects than did that of the New Hires. Age, educational attainment, and gender all had significant impacts on the change in real earnings for Retrainees.

The age of the Retrainees had an effect similar to that for New Hires. Retrainees received an estimated $140 less in their change in real earning for each year older they were. Again this indicates that the training enhances productivity somewhat more for younger workers.

Table 5
Regression Models For Predicting Change In Adjusted Annual Earnings Retrainees

(N=33,186)

Variable	Coefficient (Standard Error)	Adjusted R2=.122
Intercept	-$5,574*** (691)	
Complete Training	8,845*** (162)	
Age	-140*** (6.4)	
Gender (Female)	-753*** (163)	
Marital Status (Married)	-322 (151)	
Gain	1,931 (1,764)	
Disabled	697 (939)	
Education		
< H.S.	Base	
H.S. Grad	1,484** (415)	
Some Coll.	1,634** (426)	
Coll. Grad.	2,247*** (442)	
Post Bacc.	1,732** (484)	

Table 5 (Continued)

Variable	Coefficient (Standard Error)
Ethnicity	
White	Base
Black	-156 (293)
Hispanic	-130 (222)
Indian	-264 (996)
Asian	860** (238)
Other	292 (541)
Missing	193 (362)
Veteran	-448 (232)

Table 5 (Continued)

Variable	Coefficient (Standard Error)
Program Characteristics	
Number in Program	.06 (.06)
Industry	
Agriculture	3,327*** (756)
Construction	1,775 (975)
Manufacturing	1,262* (456)
Transportation, Utilities	Base
Wholesale/Retail	1,445* (460)***
Finance, Insurance Real Estate	2,000*** (494)
Service	1,468* (486)
Food Production	-3,101*** (596)
Other	-10,189*** (724)

Table 5 (Continued)

Variable	Coefficient (Standard Error)
Business Size	
<50	Base
51-100	1,666** (490)
101-250	3,025*** (496)
>250	2,485** (331)
Not Class	-240 (424)

* = Significant at .01
** = Significant at .001
*** =Significant at .0001

The trainee's educational attainment had its most prominent effects on Retrainees. Recall that the participants were grouped into the following educational attainment categories: less than high school graduation, high school graduation, some college experience, college graduation, and some post-baccalaureate experience. The group that did not graduate from high school was used as the base group, so the coefficients for the other groups show the effects of the indicated levels of education relative to not having graduated from high school.

Educational achievement paid off in a significantly higher change in real earnings for Retrainees. Specifically, the regression model shows that a high school degree was associated with a $1,484 greater change in earnings, while some college experience produced a $1,634 increase, college graduation yielded a $2,247 increase, and post-baccalaureate experience produced a $1,732 greater change in earnings relative to not completing high school[1].

These results produce an interesting insight on some research in the education and training area. As mentioned in the introduction, this research literature indicates that companies tend to spend more of their training dollars on employees who are more educated. Our results with the Retrainees suggests that, to the extent that earnings reflects worker productivity, training dollars enhance the productivity of more educated workers more than they enhance the productivity of less educated workers. If this is the case, then allocating company training dollars toward the more educated workers is consistent with maximizing the productivity of the workforce and of the training dollars.

There was only one significant relationships between the change in real earnings and ethnic identity for Retrainees. Recall that of the ethnic categories listed in Table 5, the coefficient for white is excluded because this category was used as the base in the regression equations. The ethnicity coefficients should be interpreted as the change in real earnings for the indicated ethnic group relative to whites. This means that, in general, the Retrainees' ethnicity did not significantly influence their change in real earnings.

Among the Retrainees, the Asian ethnic group experienced a $860 greater change in real earnings among Retrainees than did any other ethnic category. All other ethnic groups among the Retrainees experienced real earnings changes similar to those of whites.

Analysis of the Retrainees' other demographic characteristics produced only one significant influence on the change in real earnings, which was gender. Being a female Retrainee was associated with a $753 smaller change in real earnings than being male. As in the case of New Hires, the other demographic variables -- the marital status of the trainees, whether they were veterans, participants in the GAIN program, or were disabled -- had no effect on the change in earnings for Retrainees.

Retrainee Regression Results: Program Variables

The change in real earnings for Retrainees varied considerably by industry, in contrast to that of New Hires, which did not. Recall that the transportation and communication industry was used as the base industry, so the coefficients associated with the other industries should be interpreted as the effect of the industry of training relative to being trained in the transportation and communication industry.

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[1] One may note that the coefficient for post-baccalaureate experience is numerically smaller than that for a college degree, which seems anomalous at first glance. But because this difference of about $500 between these two coefficients is not statistically significant (as indicated by the standard errors of these two estimates), the correct interpretation is simply that both of these groups have earnings increases significantly greater than those of high school dropouts by an amount of around $2,000. The result that the more educated trainees experience a greater increase in real earnings (productivity) is confirmed.

Retrainees experienced greater changes in real earnings in agriculture, finance, insurance, and real estate, services, retail and wholesale trade, and manufacturing than did those in transportation and communication. Retrainees in construction experienced about the same change in real earnings as did those in the transportation and communication industry. Retrainees in food processing or those classified in "other industries" had significantly smaller changes in real earnings relative to other Retrainees.

The significant variation in the change in earnings for Retrainees across industries may not reflect inherent differences in the productivity of training among the industries; rather, it may be associated with the different impact of the individual training projects funded in that industry. Retrainee training projects are usually specific to a particular business or industry. The significant coefficients that the regression analysis attributes to certain industries may be more correctly associated with specific training projects within those industries. (The identity of the specific training project for the individual trainees is suppressed in the regression analyses, since variables representing these projects would be closely correlated with the industry variables and may produce a multicollinearity problem.) This possibility of project effects is reinforced by the observation that the industry variables are not very significant for the New Hires, for whom it is very common for the trainees from one project to be placed among several different businesses in several different industries. This possibility of project effects suggests two things. First, it is possible that a different set of ETP approved projects in another year may generate a completely different set of industry coefficients from the ones reported here. This implies that the current set of industry coefficients ought to be interpreted with caution. Second, a study of the outcomes of the various training projects may help identify some of the general characteristics of the successful projects.

Business size had a significant effect on the change in earnings for the Retrainees. Recall that the category of businesses with less than 50 employees was used as the base in this analysis, so the coefficients associated with the other business size categories indicate the effect on the change in real earnings of being placed in a business with more than 50 employees. Retrainees placed in larger businesses experienced a $1,666 to $3,025 greater change in real earnings relative to Retrainees in businesses with less than 50 employees or those not classified by size. This result has to be qualified by the fact that out of over 33,000 cases there were only 106 cases of Retrainees (with complete demographics) in businesses with less than 50 employees. This result may again be reflecting some of the individual training project effects. If not, the effect of business size on Retrainees' change in real earnings suggest that larger businesses have more productive training programs for Retrainees than do businesses with less than 50 employees.

The number enrolled in the particular training program did not have any significant effect on the change in real earnings for Retrainees. Given that the same result held for the New Hires, this indicates that there is no systematic link between the size of the training project and its impact on the change in earnings.

The Cost of Training: An Analysis of Completers

The cost of the training program per completer had a significant effect on earnings for both the New Hires and the Retrainees (see Table 6). The cost data represents the amount ETP actually paid training agencies for each successful completer and does not include the support provided by the company or training agency. The cost data only appears in the records of trainees who complete, because ETP only pays for those who successfully complete training (trained and placed on the job for at least 90 days). We reran the same regression models for completers only and added the cost per participant variable. We found a significant positive relationship between cost and the change in earnings. That is, completers from projects with a higher cost per participant experience a statistically significant larger increase in earnings. For New Hire completers, every additional dollar of cost per participant produced a $3.81 increase in real earnings. For Retrainees, every additional dollar of cost per participant produced a $0.82 increase in real earnings.

The estimated relationship for New Hires is interesting because it suggests that more expensive New Hire training projects "pay off" in greater worker productivity increases and larger earnings increases. The ratio of $3.81 in increased earning for every $1.00 spent on training is impressive, especially since this increased earning refers only to the one year after training. To the extent that the higher earnings are maintained in future years, the ratio of the sum of the increased earnings or "benefits to the costs" of training is even larger.

The results for the Retrainees are not quite as impressive. The Retrainees $0.82 increase in earnings for every $1.00 increase in training costs falls short of returning $1.00 in earnings for every $1.00 in training costs during the first year. However, if these greater increases follow the same 12 year depreciation rate as indicated in the research literature(and which are consistent with our preliminary findings for the 1989-90 cohorts), then Retrainees will exceed the $1.00 increase in earnings for every $1.00 increase in training costs by the second year after training.

If increased costs represent more intensive or longer training, these results suggest that additional training produces dividends beyond the increased cost of training, in both the short term and the long term for New Hires and in the long term for Retrainees. One must be cautious in interpreting this result because corresponding company costs for the training are not included in our measures, so the total cost of training participants is understated in our model, and the additional benefits of added training are over stated. It is an interesting result and one that merits further study.

Table 6
Impact of Training Costs on Changes in Earnings[2] For Completers

	New Hire (N=859)	Retrain (N=23,606)
Change in earnings for each $1.00 in training costs	$3.81*** (.65)	$0.82*** (.11)

Standard error in parenthesis
* = Significant at .01
** = Significant at .001
*** =Significant at .0001

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[2] All figures in 1990 dollars.

Results:1989-90 Trainees

In this analysis we track trainees from projects that completed in 1989-90 to the second year after training.

Retrainee Earnings: Year 1 and Year 2 After Training

Once again, we examine "Retrainees," ETP trainees who were employed when they entered training, separately from "New Hires," those who were unemployed when they entered training. Within these groups we analyze completers and dropouts separately. In addition, when the UI records were searched for the 1989-90 cohort the search revealed that 13.6% of ETP trainees were no longer in UI covered jobs in California. It is difficult to generalize about the experience of the trainees who were not found. They may have moved and are now working outside California; they may be working in jobs not covered by UI, such as federal jobs or self employment; they may have died or retired; they may have simply left the labor force to raise children or attend school; and some may be discouraged workers who have been unable to find jobs.

The focus of the analysis presented here is on the 83% of 1989-90 trainees who were found in Year 2. We have complete data on this large group, and it provides a valuable indicator of the impact of ETP training.

To insure complete analysis of the earnings and employment trends for ETP trainees, we did not wish to exclude the trainees not found in Year 2 from the analysis, without some understanding of who these trainees are. Thus, in a later section we compare the characteristics of those found and not found in Year 2. Table 7 shows the distribution of trainees who were found and not found among Retrainees and New Hires, dropouts and completers. As the table shows, those not found in Year 2 were far more likely to be dropouts.

Table 7
1989-90 Cohort By Trainee Group

Trainee Group	All	Trainees Found Year 2	Trainees Not Found Year 2
All Trainees			
Percent	100%	86.4%	13.6%
Number	(45,962)	(39,721)	(6,241)
Retrain Complete			
Percent	100%	89.1%	10.9%
Number	(34,510)	(30,742)	(3,768)
Retrain Dropout			
Percent	100%	78.0%	22.0%
Number	(9,553)	(7,454)	(2,099)
New Hire Complete			
Percent	100%	83.2%	16.8%
Number	(1,307)	(1,088)	(219)
New Hire Dropout			
Percent	100%	73.8%	26.2%
Number	(592)	(437)	(155)

Again, we report the earnings adjusted for inflation by stating them in 1990 dollars. This allows us to examine the real changes in earnings rather than those due to inflation. It is important to note that inflation was relatively low during the period studied, essentially 1988 to 1992, so that inflation has a limited impact on the earnings patterns. In addition, average earnings growth in California was generally less than inflation, which caused the earnings of California workers covered by UI to actually declined in real terms during the period studied, according to the Bureau of Labor Statistics. Average real earnings stated in 1990 dollars grew slightly, from $26,230 in 1986 to $26,565 in 1987 and $26,635 in 1988. They then fell to $26,215 in 1989 and to $26,180 in 1990. Finally, real earnings recovered somewhat by rising in 1991 to $26,427, which is still below its 1988 level.[3]

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[3] U.S. Bureau of Labor Statistics, Employment and Wages, Annual Averages 1990, Bulletin 2393.

Our analysis of trainees found in Year 2 indicates that the substantial gains in earnings experienced in the first year after training persisted in the second year after training (See Tables 8 & 9). This result held for both nominal and real earnings and for all training groups. The persistence of the higher earning in the second year after training is significant because studies show that for many other training programs, such as JTPA, the gains found in the immediately after training do not persist(see for example Baj & Trott,1991). This result is also impressive because over this period of time, average real earnings in California were actually falling.

A very interesting aspect of this result is the variation in the percentage and the characteristics of the ETP trainees who were not found in the UI records in the second year after training. Preliminary analysis indicates that the earnings pattern of the "not founds" was significantly different than that of the trainees who were found. As noted, the percentage of "not founds" was consistently and significantly higher for the training dropouts than for the completers.

One interesting aspect of this analysis is that the earnings experiences of the Retrainee completers and the Retrainee dropouts are very similar to one another after the trainees not found in Year 2 are eliminated from the analysis (See Tables 8 & 9). The Retrainee completers gained about 10 % in real earnings between the year before training and the year after, compared to only about 7% for Retrainee dropouts. Both groups also maintained their gains in real income in Year 2. Again, completers earned more in Year 2 than dropouts. The major difference between these two groups is that over 89 % of the completers were found in Year 2, while only 78 % of the dropouts were found.

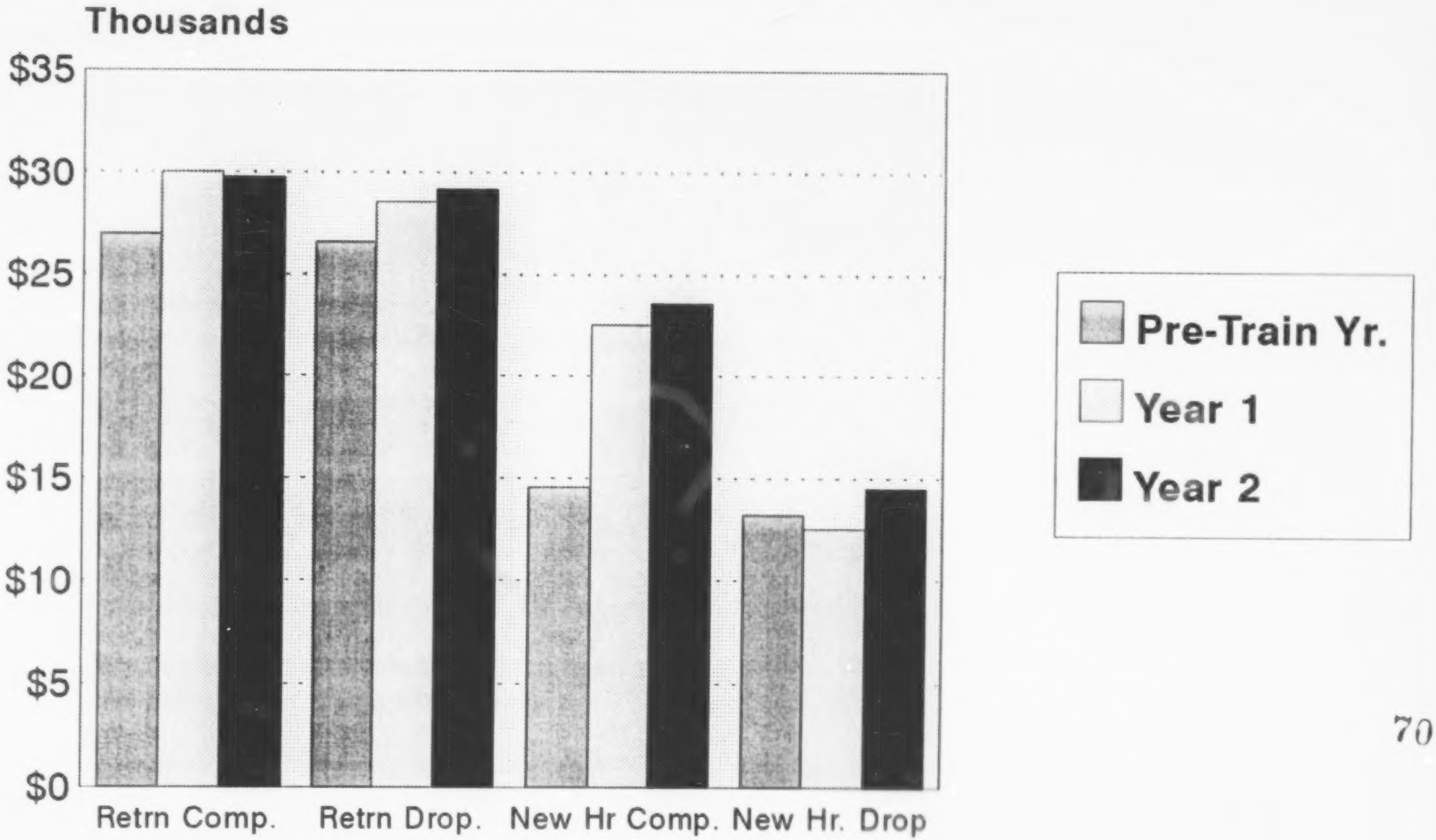
Taken at face value, this is a markedly different pattern than we found last year in our first analysis of the 1989-90 Retrainee completers and dropouts. That analysis showed the Retrainee completers to gain over $1,600 in real earnings, while the dropouts lost over $2,000. The obvious difference between Retrainee dropouts' earnings reported last year and those of the dropouts found in Year 2 lies in the earnings of those dropouts not found in Year 2. In fact, this "not found" group's real earning only amounted to less than $12,000 in the year after training, and in Year 2 they disappeared from the UI records completely.

New Hire Earnings

The New Hire completers who were found in Year 2 experienced very impressive gains in real earning from the year before training to the year after. Real before training earnings were $14,555 and after training earnings jumped to $22,553, a real gain of almost $8,000. The New Hire completers maintained these impressive gains in Year 2, with real earnings of $23,615. The gains by this group in the first year reported here are higher than those reported last year; this results from the selected nature of those found in the second year. Preliminary analysis shows that those not found in the second year had Year 1 earnings at just over $9,000, which is a substantial drop from the $14,000 average earnings before training.

The New Hire dropouts who were found in Year 2 showed a decrease in real earnings one year after training. Before training earnings amounted to $13,199, compared to $12,536 the year after training, for a real decline of $663. This group had a gain in Year 2, with an average of $14,518. The pattern for these "found in Year 2" dropouts is different from that reported last year, when the New Hire dropouts lost over $2,000 in real earnings. Again, this difference is attributed to the earnings characteristics of the dropouts not found in Year 2, for whom preliminary analysis indicates that Year 1 earnings were less than $9,000. The percentage of "not found in Year 2" was also large for this dropout group, amounting to nearly 22 % of those for whom we have records for the year before and the year after training. Clearly, these 22% are faring worse than the ones who were found in Year 2.

1989-90 Trainees Found In Year 2
Adjusted Earnings Pre-Training, Year 1 and Year 2



California State University, Northridge ETP Outcomes Project 1992-93

Table 8
1989-90 Trainees Found In Year 2
Unadjusted Earnings Before Training, Year 1 and Year 2

Group	Pre-Train-Earnings	Year 1 Earnings	Change in Earnings	Year 2 Earnings	Change Yr1-Yr2
Retrainee Completers (N=30,742)	$24,043	$29,901	+$5,858 (+24.4%)	$30,889	+$989 (+3.3%)
Retrainee Dropouts (N=7,454)	$23,602	$28,367	+$4,765 (+20.2%)	$30,216	+$1,849 (+6.5%)
New Hire Completers (N=1,088)	$12,770	$22,372	+$ 9,602 (+75.2%)	$24,386	+$2,014 (+9.0%)
New Hire Dropouts (N=437)	$11,621	$12,465	+$ 843 (+ 7.3%)	$13,303	+$838 (+6.7%)

Table 9
1989-90 Trainees Found In Year 2
Adjusted Earnings Before Training, Year 1 and Year 2 In 1990 Dollars

Group	Pre-Train-Earnings	Year 1 Earnings	Change in Earnings	Year 2 Earnings	Change Yr1-Yr2
Retrainee Completers (N=30,742)	$26,963	$30,033	+$3,069 (+10.2%)	$29,791	-$242 (-0.8%)
Retrainee Dropouts (N=7,454)	$26,590	$28,556	+$1,966 (+ 7.4%)	$29,203	+$647 (+2.3%)
New Hire Completers (N=1,088)	$14,555	$22,553	+$7,998 (+54.9%)	$23,615	+$1,062 (+4.7%)
New Hire Dropouts (N=437)	$13,199	$12,536	-$ 663 (- 5.0%)	$14,518	+$1,982 (+15.8%)

Employment:

Among both Retrainees and New Hires, completers were unemployed less often and collected less in UI Payments than dropouts, in both Year 1 and Year 2 after training.

Retrainee UI Weeks and Payments

As in the earlier study (Moore and Blake, 1992), Retrainees who completed were unemployed less often in Year 1 after training than Retrainees who dropped. This pattern persisted into Year 2, when completers were unemployed an average of 0.8 weeks compared to 1.0 weeks for dropouts (See Table 10). It is interesting to note that weeks of unemployment went up for both groups in Year 1 and down in Year 2.

UI Payments received by Retrainees follow this pattern. Dropouts collected more in UI payments in Year 1 and Year 2 than completers. For example, in Year 2 the average payment to a completer was $121, compared to $219 from dropouts. This difference persists despite the fact that the least successful dropouts were not found in Year 2.

New Hire UI Weeks and Payments

Again, New Hire completers were less likely to be unemployed in Year 2 than were dropouts. Completers averaged 2.4 weeks of UI claims, compared to 3.6 weeks for dropouts (See Table 10). Payment followed accordingly, with completers receiving an average of $352 and dropouts receiving $509 (see Table 11).

1989-90 Trainees Found In Year 2
UI Payments Pre-Training, Year 1 and Year 2

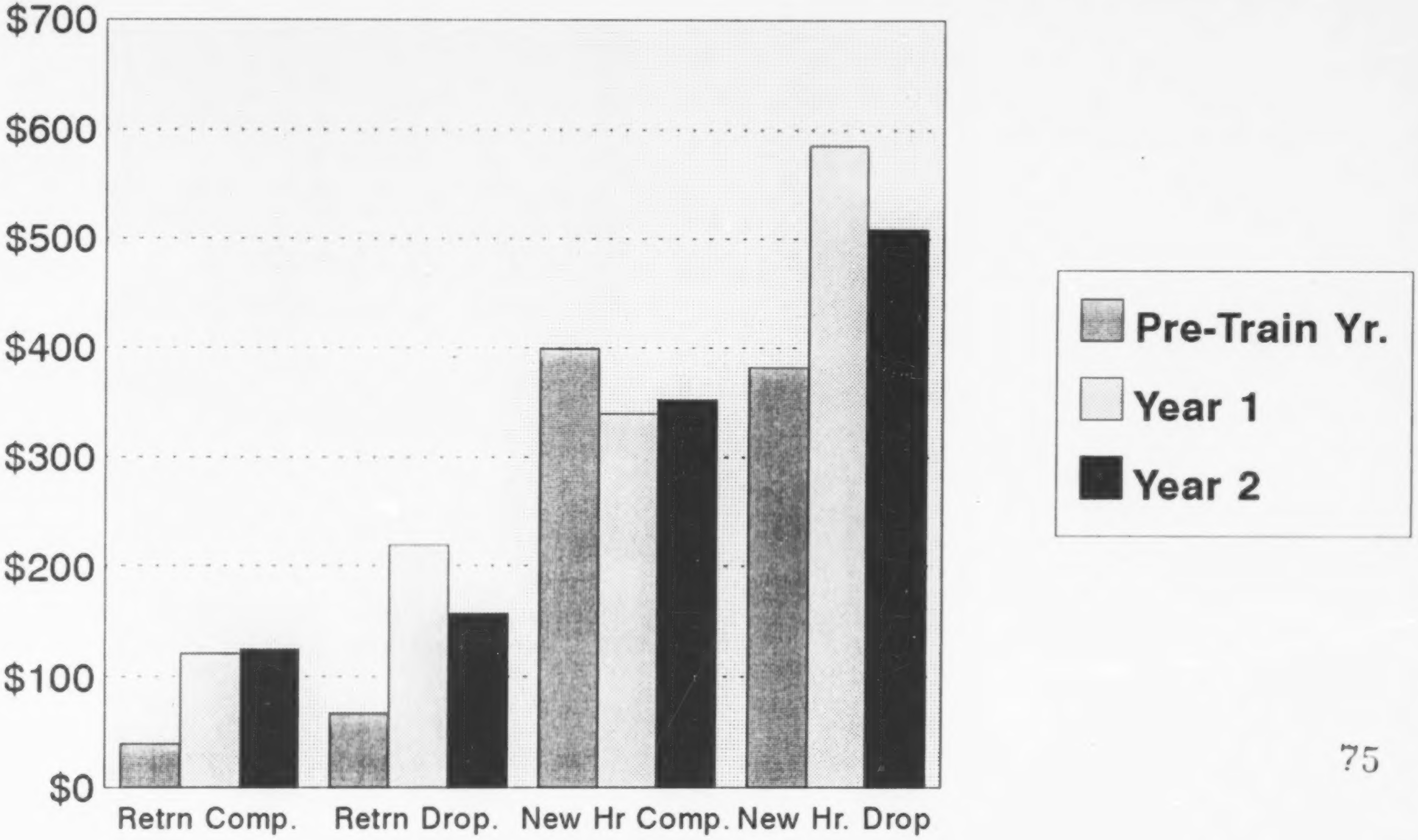


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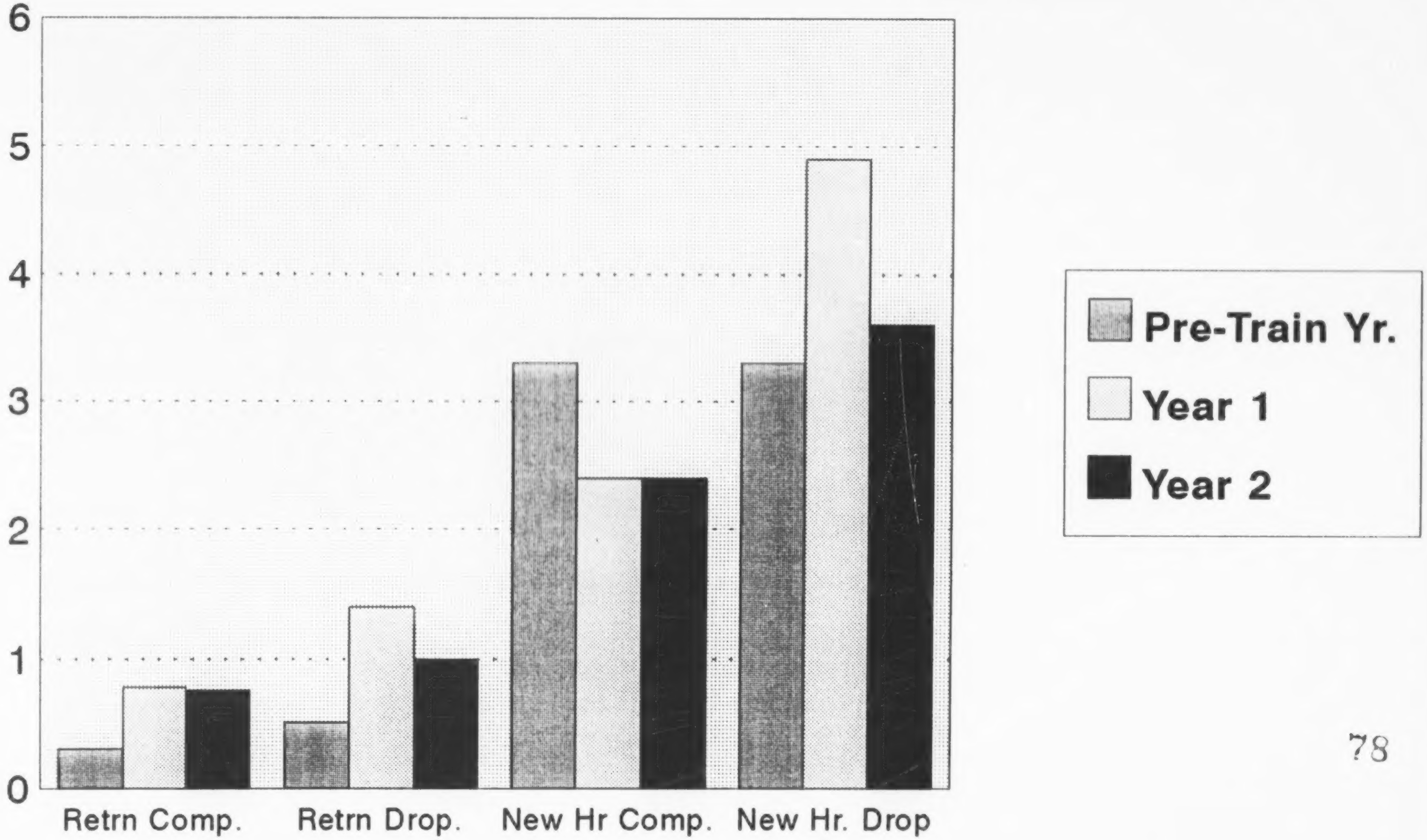
Table 10
1989-90 Trainees Found In Year 2
Weeks Receive UI Before Training, Year 1 and Year 2

Group	Pre-Train-Weeks	Year 1 Weeks	Change in Weeks	Year 2 Weeks	Change Yr1-Yr2
Retrainee Completers (N=30,742)	0.31	0.78	+0.47 (+151.6%)	0.76	-0.02 (-2.6%)
Retrainee Dropouts (N=7,454)	0.51	1.4	+0.89 (+174.5%)	1.0	-0.4 (-29.6%)
New Hire Completers (N=1,088)	3.3	2.4	-0.9 (-27.3%)	2.4	0 0
New Hire Dropouts (N=437)	3.3	4.9	+1.6 (+48.5%)	3.6	-1.3 (-26.5%)

1989-90 Trainees Found In Year 2
Weeks of UI Pre-Training, Year 1 and Year 2



California State University, Northridge ETP Outcomes Project 1992-93

Table 11
1989-90 Trainees Found In Year 2
UI Payment Received Before Training, Year 1 and Year 2

Group	Pre-Training Payments	Year 1 Payment	Change in Payments	Year 2 Payment	Change Yr1-Yr2
Retrainee Completers (N=30,742)	$40	$121	+$81 (+202.5%)	$125	+$4 (+3.3%)
Retrainee Dropouts (N=7,454)	$67	$219	+$152 (+226.9%)	$157	-$62 (-28.3%)
New Hire Completers (N=1,088)	$399	$339	+$60 (+15.0%)	$352	+$ 13 (+ 3.8%)
New Hire Dropouts (N=437)	$382	$585	+$203 (+53.1%)	$509	-$76 (-13.0%)

Analysis of 1989-90 Trainees Found and Not Found

To better understand the trainees not found in Year 2, we compared trainees who were found with those who were not on the available data. The variables on which there were significant differences are presented in Table 12.

The data show that while trainees who were not found were slightly more likely to be New Hires, they were over three times as likely to have dropped out of ETP training as those that were found. In the case of dropouts, it may be that these trainees were a poor fit for the jobs for which they were trained and left. In the case of completers, they may truly have been potentially displaced and ETP training may not have been enough to save their jobs past the 90 day retention period and hence they either lost their job or left the state.

Demographic differences paint a murky picture. One might expect that those not found would be from groups who traditionally have had a weaker attachment to the labor force, such as young people, ethnic minorities, people with low levels of education and women. The results here support this notion only in part. Women and those with less than a high school diploma are less likely to be found in Year 2. But Hispanics and Asians are more likely to be found, while whites and blacks are less likely to be found. Similarly, while those with less a than high school education are less likely to be found, as we would expect, trainees with a college degree are also less likely to be found.

There were few difference in the industries in which trainees were trained. Those not found were slightly more likely to be from the durable manufacturing, finance, insurance and real estate industries. They were less likely to have been trained in construction or retail/wholesale.

These demographic differences probably mask divergent trends among the trainees. For example, some college educated men may have left California to seek better opportunities elsewhere, while some trainees with low previous earnings and low levels of education may have lost their jobs and simply dropped out of the labor force.

Table 12
Differences Between 1989-90 Trainees Found in Year Two and Those Not Found
(N=45,962)

	Found (N=38,176)	Not Found (N=7,786)	Sig.
Eligibility			.001
Retrain	96.1%	95.1%	
New Hire	3.9%	4.9%	
Completion			.000
Complete	81.0%	37.0%	
Drop	19.0%	63.0%	
Gender			.000
Male	50.9%	46.8%	
Female	49.1%	53.2%	
Ethnicity			.000
White	58.5%	63.8%	
Hispanic	19.4%	16.2%	
Black	6.3%	6.7%	
Asian	13.1%	9.9%	
Other	2.7%	3.4%	
Education			.000
Some H.S.	4.5%	6.4%	
H.S.Grad	41.5%	41.5%	
Some College	31.9%	29.8%	
College Grad.	15.3%	16.4%	
Coll. Grad. +	6.8%	5.9%	

Table 12 (Continued)

	Found (N=38,176)	Not Found (N=7,786)	Sig.
Industry			.000
Agriculture	.06	.19	
Construction	2.59	1.81	
Durable Manufacturing	28.77	29.51	
Non-durable Manufacturing	4.25	4.12	
Transportation Utilities	.70	.71	
Retail/ Wholesale	20.79	18.15	
Finance, Ins. Real estate	18.34	22.81	
Other Service	9.83	9.17	
Unclassified	14.67	13.52	
AFDC Recipients	.04%	.05%	
Disabled	.41%	.39%	

Estimating the Impact of ETP Training on the California Economy for 1990-91 Trainees

The impact of ETP training on the California economy is the difference between what did occur in the California economy with ETP training programs in place and what would have occurred in their absence. The estimates of ETP's impact range from nearly $100 million to over $500 million in the first year after training, depending on the effects taken into account and the assumptions used.

Our analysis of ETP's economic impact has two steps. First, we analyze the economic dynamics of ETP training to identify the components through which ETP training programs can affect economic activity. Next, we estimate the impact of ETP training on each of the components, and then aggregate the component effects to get the overall impact of ETP on the state's economy.

The Economic Components

The economic impact of ETP training has four components.

Component 1: Unemployment Insurance savings
Component 2: Increased productivity of trainees (measured by increased earnings)
Component 3: Multiplier effects of increased productivity
Component 4: Value of jobs saved

We estimate the economic impact of ETP training on the California economy for the first year after training using these four components In the following section, we explain how ETP training affects each component and how we arrived at our estimate of the impact. We also estimate the longer term impact of ETP on worker productivity, based on the second year earnings records for the 1989-90 cohorts and available research.

Figure 2
First Year Impact of ETP Training
Conceptual Model

		Component 1:		Component 2:		Component 3:		Component 4:
State-wide Economic Impact	=	UI Cost Savings	+	Productivity Increase (Earnings Change)	+	Multiplier Effect of Increased Productivity	+	Value of Jobs Saved

Component 1: Unemployment Insurance Savings

One goal of ETP training is to reduce unemployment among participants and, as indicated above, ETP does reduce unemployment among both New Hires and Retrainees. An outgrowth of reducing unemployment is that ETP saves the state money by reducing Unemployment Insurance (UI) claims that would otherwise be paid to unemployed workers. The New Hires are unemployed at the time of training and presumably their unemployment would continue for some period of time if they were not trained and placed by an ETP program. Retrainee Completers also have lower post-training unemployment than do Retrainee Dropouts. In addition, the Retrainees may also be saved from suffering substantial unemployment by ETP retraining, since ETP requires that Retrainees be in jeopardy of losing their jobs. Presumably, ETP training saves the Retrainees from this near certain unemployment and therefore lowers Unemployment Insurance outlays.

We have developed two estimates of the UI savings attributable to training. Our first measure of the impact of ETP training on Unemployment Insurance claims is the difference between the post-program UI claims of completers and the post-program claims of dropouts. The assumption here is that without ETP training (which includes placement), completers would experience the same level of UI claims as dropouts. Thus, the difference between the UI claims of completers and the dropouts times the number of completers is our estimate of the UI savings attributable to ETP training. This calculation is made for both Retrainees and New Hires to obtain the estimate of UI savings as shown in Table 11.

Our second estimate for UI savings makes the reasonable assumption that the Retrainees would experience some average period of unemployment if they had not received training. This alternative assumption derives from the ETP program requirement that the Retrainees be in jeopardy of losing their jobs if training is not provided. If this criterion is rigorously applied, one would expect the Retrainees to have become unemployed if ETP training had not been provided. An estimate for the dollar value of UI claims in this case can be calculated by multiplying the average weekly claims times the average period of unemployment.

We have three slightly different estimates of the average period of unemployment (as shown in Scenarios 3A, B and C in Table 13). Estimate A is based on our study population and assumes that the Retrainees would have had the average number of weeks of UI claims experienced by the New Hires during the year before training, which was 12.0 weeks. This average is likely to underestimate the true period of unemployment for these workers since our data only include the last complete quarter before entry into a training program, and one would expect the New Hire trainees to experience substantial unemployment during the actual quarter that they enrolled in training. Thus, this estimate omits the UI claims in the quarter in which the unemployed person enrolled in training. This 12.0 week estimate is conservative and used because it represents the lowest available estimate of an average unemployment period.

Two other reasonable estimates of average unemployment periods are 13.0 weeks or 16.3 weeks. The 13.0 week average duration is the 1991 Bureau of Labor Statistics estimate as determined by their monthly labor market survey for California, and is shown in Scenario 3B. The last estimate, 16.3 weeks, is the actual average unemployment duration for UI claims filed in California in 1991, and is shown in Scenario 3C.[4]

The UI savings reported in Scenario 1 in Table 13 for the 1990-91 cohort group are larger than those reported last year for the 1989-90 group (Moore and Blake, 1992). This produces a greater estimated UI savings in 1990-91 from ETP because of greater 1990-91 UI payments to Retrainee Dropouts relative to Retrainees Completers compared to 1989-90. This larger difference in UI payments more than compensated for the decrease in the number of Retrainees Completers in the 1990-91 period relative to the previous year. These differences produced a Scenario 1 UI savings estimate for the 1990-91 cohorts that is over $3.5 million higher than that for the 1989-90 cohorts.

The estimated UI savings for the various periods of unemployment shown in Scenario 3 are also larger than those estimated for the 1989-90 cohorts for two reasons. First, the average period of unemployment was higher in 1990-91, regardless of the source of the unemployment duration estimate. The 1990-91 duration estimates of 12.0, 13.0, and 16.3 weeks correspond respectively to 1989-90 estimates of 9.5, 10.6, and 14.2 weeks. Second, the average postyear weekly unemployment payment was higher for the 1990-91 cohorts relative to their predecessors. These differences added about $10 million to the UI savings estimates for the Retrainees in each of the cases described in Scenario 3, when compared to the estimates for the 1989-90 cohorts.

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[4] The average length of unemployment from the household survey which covers all workers (scenario 4B) is shorter than the state-wide average number of weeks UI collected because workers covered by unemployment insurance tend to be out of work for longer periods than the average for all workers. These 1990 averages were obtained from the California Employment Development Department.

Component 2: Productivity Increase

The productivity of ETP trainees may increase either because they produce more per hour worked or because they work more hours in a year. Any training program that increases the marketable skills of the participants creates additional economic capacity to produce. ETP programs may have an advantage over other training programs, though, because of the placement requirement in ETP contracts. Other training programs create the potential to produce more; that potential is realized when the newly trained workers are placed. ETP contracts require placement as a condition of training, so when ETP training is completed the economic potential of the enhanced productivity is realized. Thus, the impact of ETP training is realized immediately in increased output for the California economy, due to the enhanced productivity of the trainees who complete the program. In addition, because trainees are now more skilled, they may have the opportunity to work more hours by avoiding periods of unemployment associated with less marketable skills.

Unfortunately, directly measuring an individual's change in productivity is difficult and expensive. Direct measurement of productivity requires accurate physical output and input data for the periods before and after training. Such data are generally not available, and ETP projects are no exception. Even if those data were available, direct measurement of individual productivity is complicated because newly trained workers typically work with different equipment, different materials, and differently skilled people than they did before training. It is difficult to separate a single worker's change in productivity from the contribution made by the new equipment, new materials, and differently skilled workers.

In this project, as in most studies, the change in earnings is used as an indicator of the change in worker productivity. Standard economic theory implies that workers are paid the value of their contribution to production (their marginal product). Accordingly, an increase in productivity should result in an increase in workers' earnings. The advantage of using earnings as an indicator of productivity is that earnings data are much more available than physical output data and earnings data are reported on an individual basis. Because records of the physical change in production levels do not exist for ETP projects, we used the changes in earnings data as an indicator of changes in productivity.

The regression analysis produced estimates of the impact of completing ETP training for both New Hires and Retrainees. Those estimates are a $12,209 increase in real earnings for New Hires and an $8,845 increase for Retrainees when the other independent variables are evaluated at their average values. As indicated in the regression analysis section above, these values are very close to average change in real earnings for New Hire and Retrainee completers. To estimate the economic impact we choose the slightly more conservative measure which is based on the average change in real earnings actually experienced by the New Hire and Retrainee completers. This change in earnings number was available for all of the 31,131 people who completed training in the sample period. The overall total was comprised of 29,586 Retrainees and 1545 New Hires who completed training.

For 1990-91 Retrainees who completed training, the tabulated average increase in real (inflation-adjusted) earnings was $2,621, as reported in Table 3. This compared to an actual decrease in real earnings for Retrainee Dropouts of $584. If one were to assume that the decrease in real earnings experienced by the dropouts is what the Retrainees Completers would have experienced without ETP training, then the effect of training completion would be to increase Retrainee earnings by $3205, the sum of $2,621 and $584. However, to be conservative in estimating the effects of training, we took the simple increase in Retrainee Completer earnings, $2,621, as the estimated measure of the effect of training for this group.

The 1990-91 New Hires who completed training experienced a $9283 increase in earnings in the year after training. The New Hires who did not complete training also experienced an increase in earnings during the same period, but their increase was only $894, less than one-tenth of that of the completers. We measured the increase in productivity associated with completing training for the New Hires as the difference between the earnings of the completers and the dropouts, or $8,389.

These estimated productivity increases compare favorably to the estimated productivity increases for the 1989-90 cohorts. As reported last year, the 1989-90 New Hire Completers earned $7399 more compared to the $8389 differential increase in 1990-91. The 1989-90 Retrainees Completers earned $1615 more, compared with an increase of $2621 for the same group in 1990-91. That is, the 1990-91 training completers' annual earnings changed by about $1,000 more than those of the 1989-90 completers.

The use of these numbers as a basis for estimating the overall impact of ETP on the California economy satisfies two objectives. First, since these averages are based on the full number of training completers in the sample period, there is no question of the representativeness of the smaller group (for whom there were complete demographic and program records) used in the regression analysis. Second, the use of the actual reported change in earnings for completers, rather than a projected changed based on regression equations, eliminates any question pertaining to the influence of the smaller explained variation on the estimated impact of ETP. In Table 11 we simply multiplied the average change in real earnings attributed to training times the number of completers, for New Hires and Retrainees, to get the total change in productivity for the trainees.[5]

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[5] Some researchers argue that changes in wages underestimates the increase in productivity because some common pay practices (see for example Bishop, 1985). If this is correct then these estimates understate the real impact of ETP training.

Component 3: Multiplier Effects Of Increased Productivity

ETP training programs have the potential to have an economic impact beyond the direct effects on the program participants and the firms in which they are employed. Whether this potential economic impact is realized depends on the nature of the training and the competitors of the firms in which they are placed. Specifically, the workers must be Retrainees and the firms must be in basic industries for the potential indirect economic impact to be realized. We define basic industries as those which must compete with out-of-state businesses. For example, a company that manufactures computers competes with companies out-of-state and in other countries and is thus in a basic industry. Conversely, a restaurant does not compete with other restaurants out of the state, but with other local restaurants and thus is not a in a basic industry. The reasons for these assumptions are explained below.

The ETP retraining programs involve workers who are already employed by a firm but are in jeopardy of being laid off because this particular part of the firm's operation is becoming economically not viable. In other words, this part of the firm's operation is not "meeting its competition" and the firm will lose market share, have to cut production, and workers as a result. ETP retraining programs directly enhance the competitiveness of California businesses by increasing both the skills of the workers and the skill requirements of those workers' jobs. Businesses that have ETP retraining programs thus may be expected to preserve or to expand their market share relative to what would have happened without the ETP program. In this way the layoff jeopardy of the workers is reduced.

Because ETP retraining programs upgrade both the workers' skills and their jobs, these ETP programs strengthen the competitive advantage of California businesses relative to their competitors. The enhancement of a firm's competitive advantage produces an economic impact beyond the direct effects of ETP on the businesses and the workers. To the extent that ETP retraining programs strengthen the competitive advantage of California businesses relative to their out-of-state competitors, this means increased sales for these California businesses and increased sales and jobs for their in-state suppliers. The impact of the retraining programs on the California economy would be the increased production in the businesses with the retraining programs, plus the increased activity of their various suppliers. The aggregate of the increased production of their suppliers is the "indirect effect," of the direct impact on the businesses with retraining programs. This indirect economic impact is called a "ripple or multiplier effect" and it requires that there be no offsetting negative effect on other California suppliers. California's economic environment and the conditions which lead to multiplier effects in the California economy are described below.

California has the largest economy of any state in the nation and is a major trade center for the Pacific Rim. Recent advances in communications and information processing technologies, along with falling transportation costs, have produced keen competition in the markets for nationally and internationally traded commodities and services. Consequently, California businesses that produce, warehouse, transport or sell nationally and internationally traded goods and services face rigorous domestic and international competition.

Whether a particular retraining program has a multiplier effect in the California economy depends critically on the location of the competitors of that business. If that firm's competitors are located out-of-state then the increased activity of this business and its suppliers comes at the expense of out-of-state, firms and suppliers. This would produce a net gain in production and jobs for California. However, if a firm's competitors are other California businesses then this firm's gains and its suppliers' gains come at the expense of other California businesses, and produce essentially no net gain for the California economy.

In standard economic theory, regional multipliers are derived from the distinction between "basic" activities and "service sector" activities. The businesses that operate in these competitive national and international markets are the "economic base" of the region's economy. According to the regional theory, these "basic" activities generate the jobs in the "service sector" of the local economy through orders from their local suppliers and through payroll expenditures that generate local household demands. The "services sector" includes all the businesses that are suppliers to locally-situated industry and households, or, put another way, businesses which respond to locally-generated demand for goods and services. Regional theory postulates that variations in the output of the basic industries spawn variations in their local orders and their payroll, which in turn cause variation in the demand for the service sector products. Regional multipliers show the relationship between a change in the output of a basic industry and the output of a region as a whole (basic plus service sector). Basic industries that have a greater proportion of local suppliers and high local payrolls relative to output have larger multipliers. Basic industries that have weaker linkages to the local economy have smaller multipliers.

The service sector is typically identified with local suppliers of large firms, retail trade, local business services, most personal services, and local government activities. In contrast, businesses that supply demands generated outside the local economy are part of the economic base. The economic base encompasses all export-oriented activity and includes: the portion of local hotels, restaurants, entertainment and retail trade that services visitors; governmental activities funded by non-local sources; and interregional financial, insurance, transportation, and utility networks.[6]

The simple classification of the firm's industry as either basic or service sector usually determines whether a particular training program will have multiplier effects. However, there are some cases in which retraining programs in the service sector could also have multiplier effects. This would occur in the case where a firm's market consists of local customers but the firm competes with out-of-state producers who also supply this local market. This is the case of "import substitution," when an increase in the firm's output takes place at the expense of imported goods instead of locally-produced goods. If new local production replaces consumer or production goods and services that would have otherwise been imported from outside the region, then this new locally-oriented production generates additional local jobs. In short, this import-substitution type of service activity can have multiplier effects. If all of the service sector training done by ETP were in businesses which competed with non-California suppliers, then the productivity enhancement in those industries would also be subject to a multiplier effect on local jobs.[7] The multiplier effect accounts for the new economic activity created in the service sector as local suppliers respond to the higher demands from the firm and the community. This analysis suggests that ETP could be most effective in fostering economic growth in California by concentrating its retraining programs in firms in the basic sector or involved with import substitution. Retraining in these industries would increase output both directly (the productivity effect) and indirectly (the multiplier effect). For example, if all of the retraining programs in 1990-91 had been directed at workers in these types of firms, the indirect impact on California production would have been over $25 million higher in the first year alone.[8]

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[6] Basic industries in the California economy have been researched and identified by the Center for the Continuing Study of the California Economy (CCSCE) in Palo Alto.

Note that training among the Retrainees is likely to generate these multiplier effects but training among the New Hires is not. Retrainee programs involve an upgrading of the job as well as the workers' skills. By upgrading jobs, businesses gain a competitive edge in the market and therefore will order more goods and services from their suppliers. An additional effect occurs as the Retrainees become more productive, earn more, and thus spend more in the local economy, generating additional economic activity.

In contrast, ETP trains New Hires because these people are currently unemployed and require training to qualify for a job that is already available. An important feature of new hire training is the presumption that the job is available, and that if the New Hire trainee did not fill the job, someone else would. Thus, the consistent assumption for the New Hire trainee is that the training increases the productivity of the newly-trained worker, but does not increase the level of production in the host firm. This assumption -

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[7] The industry codes listed for the ETP projects studied here are not sufficiently refined to clearly identify whether the industry is export oriented or locally oriented.

[8] The estimated increase in California production is $25,822,500, and is based on the .9 multiplier effect being applied to the 37% of Retrainees who were not in basic industries in the 1990-91 period.

- that no new or more productive jobs are created in training New Hires -- limits the benefits of New Hire training to the increase in productivity experienced by the worker. That is, the benefit of New Hire training is only the increased productivity of the work force and the productivity of California businesses is not enhanced through New Hire training. This assumption is conservative but it is justified by the nature of most of the New Hire training projects. This conservative assumption is maintained throughout the series of estimates. Multiplier effects are assumed only for the retraining programs where job upgrades are present.

The multipliers used in this study were developed from the IMPLAN system specifically for this impact analysis. The IMPLAN system can generate output, income, and employment multipliers, among others. A more complete description of the IMPLAN multipliers appears in Appendix C, along with the multiplier values for the various industries. We used the set of output multipliers for California's basic industries, which averaged about 1.9. This multiplier value[9] indicates that for each dollar of new activity in the basic sector, 9/10 of an additional dollar of activity is created in the service sector.

It is common to apply the multipliers to changes in basic activity to determine the effect of that change on total activity. We used a list of industries that have been determined to be basic industries in California, to determine the likely extent of retraining programs that are in basic industries or involved with import substitution. In cases where there was any doubt, we obtained the ETP contract information to determine the nature of the business and the competitors in its market. Our analysis of the ETP projects indicates that about 63 percent of the retraining occurred in firms with potential multiplier effects[10]. We therefore applied the multiplier of 1.9 to 63 percent of the increase in earnings generated by retraining to obtain this estimated multiplier effect on the economy. The results are reported in Scenario 2 below.

Component 4: Value of Jobs Saved

In theory, since ETP "Retrainees" receive training because their jobs covered by the project are in jeopardy, these people should be in imminent danger of losing their jobs. The presumption here is that without upgrading the jobs and the workers' skills, these jobs in these particular firms would be eliminated. The ETP training upgrades the jobs and the workers' productivity sufficiently to enable the firm to maintain or enhance its competitive position.

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[9] Different multiplier values are associated with different basic industries; these values commonly range from 1.5 to 2.5. Unfortunately, the training project records are not sufficiently detailed to allow for consistent distinction between the multipliers in different retraining projects.

[10] See California Economic Growth, Center for Continuing Study of the California Economy, Palo Alto, Ca., 1991, pp. A1-A5, for the list of basic industries.

Had the ETP program not existed, the retraining and job upgrading presumably would not have occurred. These jobs could have been lost to the California economy, at least temporarily. A temporary loss of these jobs to California could occur while the current companies restructure or, if those companies retrench, until other California businesses recognize the market opportunity and reestablish the lost jobs. The important variable in this component is the time period for which the jobs are lost.

If these jobs are saved, instead of temporarily lost, there are two components to the value of the savings. First, the potentially unemployed workers will not draw Unemployment Insurance for some period because they did not become unemployed. Second, the California economy will not lose the economic activity associated with those jobs for the period of time that they would have been lost. These are savings that would not occur in the absence of ETP, assuming the Retrainee's jobs would be lost. These savings therefore are a benefit of the ETP program that should be added to the economic impact of ETP.

There are no data on the period of time it takes an eliminated job to be reestablished. The proxy variable used for that period of time is the average period of unemployment for California workers. These two variables ought to be very closely related, if not mirror images of one another, because people have to fill reestablished jobs in order for them to have an economic impact.

To estimate the value of saving Retrainee jobs from temporary loss to the California economy, we multiplied the three estimates of how long workers are typically unemployed times the average adjusted weekly earnings before training for Retrainees who completed. These estimates are presented in Scenario 3.

It is worth noting that this analysis of temporary job loss is most applicable to retraining programs in firms in the local service sector as opposed to the basic sector. California jobs in the basic sector that are lost may well be reestablished in some out-of-state business, and therefore may be permanently lost to California. Lost basic sector jobs would have an even higher cost to California than estimated here because of the longer period of job loss and the multiplier effect on local service sector activity.

Estimating ETP's State-wide, First Year Economic Impact for 1990-91 Trainees

As we noted earlier, the overall first year economic impact of ETP can be thought of as the sum of the four components described above. The estimates for the four components vary depending on the assumptions that go into each component. To represent the unique contribution of each component, we created three scenarios for estimating ETP's overall impact. The assumptions that went into each scenario are described below, and actual 1990 dollar estimates for each scenario are presented in Table 13.

Scenario 1:
This scenario assumes the ETP's impact is limited to the immediate savings in UI payments, and the increased productivity of trainees. UI payments saved are estimated by multiplying the average difference between UI payments to dropouts and completers times the number of completers. Productivity is simply measured by the actual increase in completers' adjusted earnings.
First Year Impact: $ 99,302,000

Scenario 2:
This scenario retains the assumptions about UI savings and increased productivity. It then adds the 1.9 multiplier effect to the 63% of increased productivity for Retrainees that takes place in basic industries.
First Year Impact: $143,270,000

Scenario 3:
This scenario adds the estimated value of potentially lost jobs of the Retrainees to the UI savings, increased productivity, and multipliers effects. This scenario assumes that all Retrainees' jobs would be saved from temporary loss, based on the three different estimates of unemployment.
Total Impact: **A: $414,765,900**
B: $438,284,800
C: $515,905,700

Table 13
Estimated First Year Impact of ETP Training
1990-91 Trainees

Scenario	1st Year UI Savings	1st Year Increase In Productivity (Earnings)	Multiplier Effect on Increased Productivity - 1st Year	1st Year Value of Jobs Saved	Total First Year Impact on the California Economy
Scenario 1:					
New Hire Completers	$1,296,100	$12,961,000			$14,257,100
Retrain Completers	7,500,000	77,544,900			85,044,900
Total	8,796,100	90,505,900			99,302,000
Scenario 2: .9 Multiplier applied to 63% of Retrainees in basic industries.	8,796,100	90,505,900	43,968,000		143,270,000
Scenario 3:		90,505,900	43,968,000		
New Hire Completers	1,296,000				
Retrainee Completers					
A. (12.0 Weeks UI)	53,254,800			225,741,100	414,765,900
B. (13.0 Weeks UI)	57,692,700			244,822,100	438,284,800
C. (16.3 Weeks UI)	72,337,800			307,797,900	515,905,700

Long-term Impact of ETP Training

ETP training continues to have an impact on the economy beyond the year immediately after training. The productivity increases experienced in the first year after training by those who complete training can be expected to last for some time into the future. These long-term productivity increases are also benefits, of ETP and should be taken into account. To estimate the long-term benefits we must determine how long these productivity increases last and at what rate they depreciate, if they do depreciate.

We tracked the 1989-90 cohorts for a second year after training to provide some preliminary indication of the longevity of the productivity increases. Our analysis of the 1989-90 cohorts revealed a decrease in second year earnings of $242 relative to a first-year gain of $3,069 (in real terms) for those Retrainee Completers who were found in the UI data base in the second year. This produces a straight-line depreciation that will take 12.7 years to fully depreciate.[11] While this result is very preliminary, it corresponds to the result disclosed in recent research conducted by the Rand Corporation (Lillard and Tan, 1986) that indicates that training continues to have an impact on productivity for about twelve years. We therefore assumed a straight-line depreciation rate of one-twelfth per year in the productivity increase.

We estimated the long-term impact of ETP training by applying a straight-line depreciation method to the measured increases in productivity reported for the 1990-91 Retrainee completers and New Hire completers. That is, we assumed the impact of training will diminish 1/12 each year and disappear after the twelve year. We also adjusted these figures by discounting the resulting estimated future productivity changes to a 1991-92 base year which corresponds to the year after training. The appropriate discount rate was obtained by following the common practice of using a U.S. Treasury bond rate that corresponds to the period over which the benefits occur. Recent 12 year U.S. Treasury bond rates have been around 6.0 %. So, we applied a discount factor of 6.5 % to the stream of productivity increase generated by the ETP programs studied.

Table 14 shows that applying this technique yields an additional impact on productivity of $366.5 million for years 2 to 12. When added to the year one impact the total impact, on productivity is $457.0 million.

This figure compares rather favorably to our estimated $317.1 million in the long-term value of productivity increases for the 1989-90 cohorts reported last year. The reason that this number is considerably larger this year is twofold. First, the estimated increase in productivity is higher for the 1990-91 cohorts relative to the 1989-90 cohorts by about $1,000 for each group. Second, falling long-term interest rates have reduced the estimated (conservative) discount rate from 8% to 6.5%. Had it been known that long-term interest rates were going to be falling, the discount rate used in last year's report would have been smaller. Similarly, if long-term interest rates rise during the expected duration of these productivity enhancements, then the present value of the productivity increases will fall accordingly.

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[11] The second year earnings for New Hire completers actually increased by $1,063 for those that we found in the UI database. Because this is a small group relative to the Retrainee completers, we applied the depreciation rate for the Retrainees to the New Hires to be conservative in our estimation of long-term benefits.

Table 14
Estimated Long Term Impact of Productivity Changes From ETP Training 1990-91 Trainees
(8% Discount Rate)

Year	Impact (In Millions)
1	$66.3
2	54.3
3	45.7
4	38.0
5	31.3
6	25.4
7	20.2
8	15.5
9	11.5
10	8.0
11	5.0
12	2.3
Total Years 2-12	$257.2
Total Years 1-12	$323.5

Conclusions

In reviewing the related research on public and employer provided training and our own analysis of the ETP program, two overarching conclusions emerge. First, ETP is a public training program that has the same significant impact on the earnings and productivity of workers as private employer provided training. Through its impact on earnings and productivity, ETP training contributes directly to the economic development of the state and indirectly stimulates other economic activity through the multiplier effect. Second, ETP's success is due in part to the design of the program, particularly the performance-based contracts under which training is performed and the manner in which projects are selected. The success of these polices deserves careful consideration from federal policymakers as they shape national training and employment legislation. In the following sections we discuss these conclusions in more detail and recommend additional avenues for research.

1. Public investment in ETP training reduces unemployment and increases earnings for individual workers in the case of both New Hires and Retrainees.

Our analysis shows that completing ETP training has a significant impact on workers earnings, increasing the real earnings of New Hires $9,283 and Retrainees $2,621 in the year after training. It appears from the experience of the 1989-90 cohort that these increases persist for at least a second year and probably longer. These figures are comparable to results found in national studies of employer provided training for new and existing workers. In addition, both New Hires and Retrainees who complete training are unemployed less and receive less in unemployment insurance payments than those who do not complete. For example, New Hires who completed training collected an average of $839 less in UI payments in the year after training than New Hires who dropped out of training. Similarly, Retrainees who completed training collected $193 less in UI payments than Retrainees who dropped out of training. These changes represent increased productivity and employment stability for workers, many of whom were in danger of losing their job.

2. ETP training facilitates transitions between jobs for unemployed workers and technical and organizational changes within companies for employed workers.

As we noted in the introduction, the California economy is going through an extraordinary transformation, and all that is certain is that there will be more change in the future. The success of ETP training in boosting wages and reducing unemployment among New Hires shows that it is an effective program for transitioning dislocated workers into new jobs. Its performance appears to be superior to other publicly funded displaced workers programs studied by other researchers.

Since many ETP programs involve either the adoption of new technology of the implementation of new production techniques, such as Total Quality Management, or Just-in-time Delivery, the increased earnings of Retrainees indicate that these approaches have successfully raised worker productivity, resulting in increased earnings and less unemployment. Thus, it appears that ETP training can serve as a catalyst for promoting these types of organizational change, which in turn help California companies cope with the changing economic environment in which they operate.

3. ETP training is a tool for economic development in California.

Our analysis of the economic impact of ETP training shows that training can be a tool for economic development. ETP training has an impact on the economy several ways. First, training reduces unemployment and hence reduces Unemployment Insurance payments. Next, it increases worker productivity and hence earnings. If these workers are employed in basic industries, the increase in productivity and earnings has a multiplier or ripple effect and stimulates other economic activity within the state. Overall we estimated the impact of ETP training to be between $99 million and $516 million in the year after training, depending on the assumptions employed. It appears from our preliminary results and related research that training will continue to have a positive impact on worker earnings, and hence the economy, for up to twelve years.

This analysis shows that ETP's new policy of targeting basic industries should increase the impact of ETP training on the economy. Redirecting training funds from service businesses to basic industries will increase the net economic impact. Productivity and earnings increases in basic industries result in a multiplier effect which generates economic activity and jobs in local suppliers. In contrast, increased economic activity in one company in the service sector generally comes at the expense of another company elsewhere in the same area.

While ETP training is not a panacea for everything that is wrong with the California economy, it is one of many tools that policymakers can use to position California for success nationally and internationally. The ability to improve productivity and competitiveness through state subsidized training should encourage some companies to stay in California and help others to expand.

While our data suggest that ETP training may yield greater impacts on earnings within some trainee groups and among some industries, results are too preliminary for us to recommend strict targeting strategies.

4. Performance-based contracting appears to be the policy that allows ETP to generate outcomes similar to private employer provided training and should be maintained.

We noted earlier that the outcomes of ETP training in terms of increased worker earnings are similar to the outcomes other researchers have found for training which is purely private. This is unusual in a publicly-funded training program. In our view, the key to ETP's success is performance-based contracts, which hold training agencies responsible for placing and retaining trainees on a related job. These tough performance standards create the right incentives for contractors. In the case of New Hires, neither employers nor training agencies will enter into a contract unless they are certain they will be able to employ successful completers. While this may reduce the number of New Hires trained, it certainly increases the chance that those trained will end up in related employment. Our research indicates that ETP trainees will experience much larger increases in earnings than trainees in public programs where training agencies are held less accountable for placement. Time and again, analyses of public training programs have shown that if you pay for enrolling people in training, you get a lot of enrollments, but you may not get the placements needed to make the program a success.

Allowing employers to select trainees also contributes to ETP's success. In the case of New Hires, allowing employers to select trainees increases the chance that there will be a good fit between the new employee and the job. In the case of Retrainees, allowing employers to select the employees who will be trained means that resources are more likely to be targeted on groups with high potential productivity gains.

5. ETP's dynamic, project driven funding system and willingness to experiment should be continued.

ETP's success is due in large part to the dynamic or ad hoc character of the funding process. Each project is developed and reviewed individually. ETP has avoided establishing long-term, fixed relations with training providers. Instead it remains open to proposals from a variety of employers and training agencies. This has allowed ETP to move funds to employers and agencies who are most capable of delivering training that leads to jobs. Focusing on individual training programs rather than subsidizing institutions has helped keep the focus on performance. In a period of rapid economic and technological change, maintaining this dynamic approach is crucial.

Since its beginning over a decade ago, ETP has experimented with a variety of policies and funding priorities. The new legislation directs ETP to attempt to target its funding on basic industries and to promote training for "high performance workplaces," in order to increase the impact of ETP training on the economy. In our view this is a worthy experiment that warrants careful study and evaluation. The results of this new policy will provide valuable insights for future ETP projects and for other larger training programs.

There is some preliminary evidence that higher per trainee expenditures lead to increased earnings for trainees. This pattern fits with other studies of employer-sponsored training that showed earnings to increase more for longer or more frequent training. Our preliminary evidence that ETP training that costs more per participant leads to greater increases in earnings implies that more costly training does involve longer or more intense training and hence greater productivity gains for trainees. Undoubtedly this is a tribute to the ETP contracting process, which insures that higher training costs result in more training and not just higher costs. Presuming that rigorous cost control continues, we recommend that ETP consider experimentally targeting funds on longer, more intense training programs, and then evaluate them to see if the projects yield greater earnings increases.

One issue raised by the new targeting strategies is that ETP may not be able to develop enough projects that meet the criteria in the new legislation to spend all of its money. This is a relatively unusual problem in the public sector. In our view, if ETP is unable to expend all its budgeted funds on targeted projects in the current year, it is not necessarily a problem. It will take time to develop the outreach programs and public information needed to generate a sufficient number of proposals that meet the new priorities. We recommend that ETP carry over surplus funds rather than give up on the targeting strategy in the short run.

6. The success of ETP, documented here, provides a model for future national training and employment policies.

As federal policymakers develop legislation to expand and streamline federal employment and training programs for established workers, they should consider the lessons learned from ETP's experience. In our view these lessons are :

(1) Tough performance contracting standards provide the incentives to make sure training pays off;

(2) Employers can be used effectively as training providers;

(3) When employers are involved in developing curriculum and selecting participants, training is more effective; and

(4) Developing programs on a project-by-project basis, including aggressive searches for industries and companies where training can boost productivity and earnings, is an effective method for keeping training in touch with the labor market.

7. Future research should focus on understanding the impact of ETP training on employment stability, the characteristics of successful projects, and the optimum level of training.

The research reported here takes a significant step toward understanding the overall impact of ETP training on earnings in the short and midterm, but much remains to be done. An important issue which future research will have to address is the impact of training on employment stability. Do workers who receive training remain within the same occupation and with the same employer longer than they would otherwise? While it appears from these results that workers who receive training are unemployed less, more can be learned about the frequency and duration of unemployment, particularly over longer periods of time. In today's economy, many workers are forced to patch together several part-time jobs to earn a living. The impact of training on the incidence of part-time work and multiple jobbing is another aspect of employment stability that merits study.

This study has considered ETP training as a whole. We recognize that within the universe of ETP training there are hundreds of programs, some of which have a powerful effect on worker productivity and earnings and some that have little or no effect. Identifying the characteristics that distinguish effective projects from less effective projects will yield important information for targeting ETP funding and evaluating project proposals.

Data from this analysis suggests that longer and more intensive training has a greater impact on earnings. Further research needs to identify the optimum level of training, given the circumstances of the company. This may allow ETP to determine the level of support that is appropriate in an objective manner.

Finally, future research is needed to determine if ETP's new funding priorities, which target high performance workplaces, actually increase the impact of ETP training on individuals and the economy as a whole.

REFERENCES

Anderson , Patricia, Corson, Walter and Decker, Paul (1990) *The New Jersey Unemployment Insurance Reemployment Demonstration Project: Follow-up Report*. Princeton, NJ: Mathematica Policy Research, Inc.

Baj, J, Trott, C.E. and Stevens, d. (1991). *A Feasibility Study of the Use of Unemployment Insurance Wage-Record Data as an Evaluation Tool for JTPA: Report on Project's Phase I Activities*. Washington, D.C.: National Commission for Employment Policy, Research Report # 90-02.

Barnow, Bart S. (1986) "The Impact of CETA Programs on Earnings: a review of the literature." *The Journal of Human Resources* 22 (2) pgs. 157-193.

Bartel, Ann P. (1991) *Productivity Gains from the Implementation of Employee Training Programs Working Paper No. 3893*. Cambridge, MA: Nation Bureau of Economic Research.

Bishop, John; Hollenbeck, Kevin; Kang, Suk and Wilke, Richard (1985) *Training and Human Capital Formation*, Columbus, OH: National Center for Research on Vocational Education, ED268380.

Bloom, Howard S. (1990) *Back to Work: Testing reemployment services for displaced workers.* Kalamazoo, MI: W.E. Upjohn Institute for Employment Research.

Bloom, Howard S., et.al. (1992) *The National JTPA Study: Title II-A Impacts on Earnings and Employment at 18 Months: Executive Summary.* Bethesda, MD: Abt Associates, Inc.

Carnavale, Anthony P. (1986) "The Learning Enterprise: a report on the size and scope of training." *Training and Development Journal* 40: pp, 18-26.

Corson, Walter et.al. (1989) *The New Jersey Unemployment Insurance Reemployment Demonstration Project: Final Evaluation Report*. Princeton, NJ: Mathematica Policy Research, Inc.

Creticos, Peter A., Duscha, Steve, and Sheets, Robert G. (1990) *State Financed, Customized Training Programs: A Comparative State Survey.* Washington, D.C.: Office of Technology Assessment, United States Congress.

Creticos, Peter A., and Sheets, Robert G. (1990) Evaluating State-Financed, Workplace -Based Retraining Programs: A report on the feasibility of a business screening and performance outcome evaluation system. Research Report 89-08. National Commission for Employment Policy and National Governors Association.

Drucker, Peter F. (1989) The New Realities. New York: Harper and Row Publishers.

Employment Training Panel. (1993) ETP: Annual Report 1992-93. Sacramento.

Grubb, W. Norton (1991) "Postsecondary Vocational Education and the Sub-baccalaureate Labor Market: New Evidence of Economic Returns." Economics of Education Review. forthcoming.

Hornbeck, David W. and Salamon, Lester M. (eds.) (1991) Human Capital and America's Future. Baltimore, MD: The Johns Hopkins University Press.

How workers get their training: a 1991 update. (1992) Washington,D.C.: Bureau of Labor Statistics, U.S. Department of Labor, August.

Levitan, Sar A. and Gallo, Frank (1991) Got to Learn to Earn: Preparing Americans for Work. Washington, D.C.: Center for Social Policy Studies, The George Washington University.

Lillard, Lee A. and Tan, Heng W. (1986) Private Sector Training: who gets it and what are its effects. Santa Monica, CA: Rand Corporation, R-331-DOL/RC.

Lynch, Lisa M. (1992) "Private-sector training and the earnings of young workers. American Economic Review. 82(1). pp.299-313.

Lynch, Lisa M. (1993) Strategies for workplace training: lessons from abroad. Washington, D.C.: Economic Policy Institute.

Mangum, S., Mangum, G. and Hansen,G.(1990) "Assessing the returns to training" in Ferman, L.A., Hoyman, M., Crutcher-Gershefeld, and Savoie, E.J. New Developments in Worker Training: A Legacy for the 1990s. Madison, Wis.: Industrial Relations Research Association, pp.55-89.

Marshall, Ray and Tucker, Marc (1992) Thinking for a Living: Education and the Wealth of Nations. New York: Basic Books.

Moore, Richard W., Wilms, Wellford W. and Bolus, Roger E. (1988) Training for Change: an analysis of the outcomes of California employment training panel programs. Reseda, CA: Training Research Corporation.

Moore, R.W. and Blake, D. (1992) Does ETP training work? an analysis of the economic outcomes of California Employment Training Panel programs. Northridge, CA: California State University, Northridge, June 25.

National Center on Education and the Economy. (1990) America's Choice: High skills or low wages: The report of the commission on the skills of the American Workforce. Rochester, NY: National Center on Education and the Economy.

The National Center for Research in Vocational Education and The Center for Labor Research and Education. (1991) ETP: The Productivity Program. Berkeley: University of California.

National Center for Research in Vocational Education and The Center for Labor Research and Education, (1993) Choosing wisely for California: targeting the resources of the employment training panel. Berkeley: University of California, October.

Pines, Marion and Carnavale, Anthony (1991) "Employment and Training." In Human Capital and America's Future. Hornbeck, David W. and Salamon, Lester M. (eds.) (1991) Baltimore, MD: The Johns Hopkins University Press.

Reich, Robert B. (1991) The Work of Nations. New York: Vintage Books.

Salamon, Lester M. (19910 "Overview: Why Human Capital? Why Now?" In Human Capital and America's Future. Hornbeck, David W. and Salamon, Lester M. (eds.) (1991) Baltimore, MD: The Johns Hopkins University Press.

Stern, David, Hoachlander, E. Gareth, Choy, Susan, and Benson, Charles (1986) One Million Hours A Day: vocational education in California public secondary schools Policy Paper PP86-3-2. Berkeley, CA: Policy Analysis for California Education.

Taylor, Frederick W. (1911) The Principles of Scientific Management. New York: Harper.

Wilms, Wellford W., Hardcastle, Alan J. and Zell, Deone M. (1991) A Study of Industrial Restructuring in California Manufacturing: Policy Implications for Training. Los Angeles: The California Worksite Research Committee.

Appendix A:

Characteristics of Completers and Dropouts

One can obtain some differential likelihood of completing training by demographic characteristic by comparing the column percentage of "completers" for a given demographic characteristic to the corresponding column percentage for "dropouts". Table 2 reveals that married people and people of Asian ethnicity were significantly more likely to complete training. Also males, older people, veterans, and people with some college groups were slightly more likely to complete training. Groups slightly less likely to complete training included females, Blacks, Hispanics, whites, and people who did not graduate from high school.

Table A-1
Profile of Dropouts and Completers 1990-91
(Sample Trainees n=41,959)

	Completers (N=31,131)	Dropouts (N=10,828)	Chi Sq. Sig.
Gender			.000
Male	55.2	53.3	
Female	44.8	46.7	
Marital Status			.000
Married	57.1	51.9	
Single	42.9	48.1	
Ethnicity			.000
Asian	13.3	9.8	
Black	7.2	8.6	
Hispanic	18.3	19.4	
Indian	0.6	0.5	
White	58.5	59.7	
Other	2.1	2.0	
Age:			
Average	36.5	34.7	.000
Years of Educ.			.000
< H.S.	3.7	4.5	
H.S. Grad.	41.9	41.8	
Some Coll.	29.3	28.2	
Coll. Grad	17.5	18.0	
Post College	7.6	7.5	
Veteran			.000
Yes	14.4	12.7	
No	85.6	87.3	

Table A-1 (Continued)
Profile of Completers and Dropouts

	Completers	Dropouts	Chi Sq. Sig.
Gain			.404
yes	0.2	0.2	
No	99.8	99.8	
Disabled			.000
Yes	0.6	0.6	
No	99.4	99.4	

Appendix B:
Multipliers

The multipliers were developed from the IMPLAN system which consists of a set of computer programs, a national model of industrial production, and a massive data base containing estimates of final demands, final payments, production, and employment for each industrial sector for every county in the United States. The IMPLAN system is based on 1985 data and can provide estimates of interindustry purchase coefficients and the implied multipliers for any set of industries (up to 528 industries) and any collection of counties in the U.S. The IMPLAN system has been developed over the last ten years by the USDA Forest Service as an aid in land and resource planning.

The multipliers reported here were developed from the IMPLAN system with the industries aggregated to the eight industries identified in the ETP programmatic records, and for the entire state of California. These multiplier are reported in TABLE C-1 for output, income, and employment multipliers. The output multipliers are ratios involving the dollar value of output; the income multipliers translate the output activity into income for California residents; and the employment multipliers translate the output into jobs through output-to-employment ratios.

We used the output multipliers in our projections of the impact of ETP on the California economy because these ratios relate changes in output in one industry to aggregate output. That is, these multipliers show how much California output will change as a result of a change in output in a given industry. Our use of the output multipliers is also consistent with our decision to use the most conservative basis for our estimates of ETP impact (using 1.9 instead of 2.0 or 2.1).

We used a simple average of the output multipliers, instead of applying the various industry multipliers to the various ETP projects, because the multipliers are sufficiently close to one another in value that the more complicated procedure would not add any additional accuracy to the economic impact projection.

TABLE B1

	TYPE OF MULTIPLIER		
Sector	Output	Income	Employment
Agriculture Forestry Fishing Mining	1.8980	1.8787	1.7392
Construction	1.8804	2.0465	2.1362
Durable Mfg	1.8951	2.1632	2.2153
Nondurable Mfg	1.8896	2.6499	2.7280
Transportation Utilities Communication	1.8329	1.8909	2.2754
Wholesale and Retail Trade	1.9827	1.9484	1.7914
Financial Insurance Real Estate	1.6816	1.6202	1.9953
Services	2.1026	2.0267	1.7399
Simple Average	1.9	2.0	2.1

Appendix C:

Characteristics of Retrainees and New Hires
1990-91

Table C-1
Profile of Retrainees and Completers 1990-91

	Retrainee (N=41,114)	New Hire (N=2,347)
Gender		
Male	54.5%	65.6%
Female	45.4%	34.4%
Marital Status		
Married	56.4	56.5
Single	43.6	43.5
Ethnicity		
Asian	12.1	14.7
Black	6.9	18.0
Hispanic	18.6	32.6
Indian	0.5	0.5
White	59.7	32.0
Other	2.2	2.2
Age:		
Average	36.5	31.5
Years of Educ.		
< H.S.	4.0	6.0
H.S. Grad.	38.9	50.0
Some Coll.	27.3	22.9
Coll. Grad	17.1	4.9
Post College	7.5	1.4
Veteran		
Yes	13.8	15.5
No	86.2	84.5

Table A-1 (Continued)
Profile of Retrainees and New Hires

	Retrainee	New Hire
Gain		
yes	0.2	0.5
No	99.8	99.8
Disabled		
Yes	0.6	0.4
No	99.4	99.6
Industry		
Agriculture	2.1	2.0
Construction	0.7	1.2
Durable Manufacturing	47.1	51.5
Transportation	2.9	1.2
Wholesale/ Retail	19.4	7.2
Finance	9.2	5.3
Services	13.8	19.3
Food Processing	3.3	12.3
Unidentified or Mixed Industry	1.5	0